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A Marriage Has Been Arranged

Last Monday, the Government issued a White Paper detailing its intention to transfer the ownership of the nationalized part of the iron, steel and ironfoundry industry from the state to private enterprise. So far so good. However, these industries are to remain, through an Iron and Steel Board under public supervision, and amongst the processes to be supervised is "the casting of iron and steel by any process." Under the present conditions a matter of 23 per cent. of the ironfoundry industry and 19.3 per cent. of the steel castings production (by weight of output) is under state ownership. In the future there is to be a Government supervision over 100 per cent. of these industries.

It is germane to note that this supervision includes "development of production capacity; prices; raw-material supplies; research and technical training, arrangements for joint consultation between management and employees on matters of mutual interest other than wages and conditions of service and arrangements for the safety, health and welfare of employees." The nature of these controls is somewhat amplified in the White Paper, as, for instance, an appeal to the Minister of Supply is provided for.

We are somewhat disturbed by this implication that "a marriage has been arranged" between the iron and steel and the iron- and steel-foundry industries. Surely, the more sensible motion would have been a "love match" between the various organizations catering for the welfare of the manufacturers of cast products. On the trade union side, this state of affairs is largely in existence, whilst technically since 1902 there has been full co-operation between all sections of the foundry industry. The two (or is it three) major interests coming within the scope of this White Paper are so patently different as to create a situation *pour rire*. For a board of twelve to carry out the supervision of Margam and the two-man foundry down a back street is obviously ridiculous. This state of affairs does seem to be realized in the White Paper, where, in the statement "the production, with or without heat, of iron or steel by rolling or forging (*excluding drop-forging and blacksmiths' hand forging*) . . . " our italicised words indicate special conditions too insignificant to control. There is within iron founding a very large section comparable with drop forging and blacksmiths' hand work. We ask all ironfoundry owners carefully to examine this White Paper, visualize its major implications and do all that is within their power, through their own organizations to contract out of the proposed arrangements. In such a diverse industry as founding, making as it does products ranging from a boot-protector to a mammoth engine-bed, control, to be wisely applied, must be of the lightest character, so much so that, that one designed to cover both the iron and steel manufacture and ferrous founding is to our mind totally inappropriate.

F

Steelworks Extension

John Summers' £17,000,000 Project nearing Completion

Last week, our representative visited the works of John Summers & Sons, Limited, at Shotton, near Chester, to see the extensions now nearing completion. These have been thought essential because the modern hot- and cold-strip mills, to work to capacity, needed a larger supply of steel ingots. To-day, to manufacture large quantities of steel economically, a blast-furnace with coke-ovens, sintering plants, and so forth, have to be installed. Shotton is favourably placed on dune land, of which 283 acres are occupied by the new project. This ground has been raised above the general level by pumping wet sand on to the land and this makes a first-class foundation. The new plant consists of 44 coke-ovens and the necessary by-product plants. The blast-furnace, which has a hearth diameter of 27 ft. is the largest so far erected outside the United States. Its output will depend on the iron content of the ores used. It was interesting to note that the contractors for its lining had installed lines of slat conveyors, for the amount of bricks and refractories involved would be sufficient to construct a sizeable housing estate. With the blast-furnace go ore-handling and sintering plants, stockyards, and a power-station and blower-house combined.

The melting plant, magnificently housed in a truly modern shop, is furnished with eight 150-ton well-instrumented open-hearth furnaces. The ingot moulds are mounted on cars, which are removed to the rolling mills for stripping and soaking. The estimated capacity, 14,000 to 15,000 tons a week, is such that it will give 50 per cent. more steel than the two existing shops, which are to be scrapped. The blast-furnace should supply something of the order of 8,000 tons of iron a week.

These developments have cost about £17 million. Furthermore, as scrap seems likely to stay in short supply in this country, a second blast-furnace is envisaged, together with another battery of 88 coke-ovens, built as two units, whilst provision has been made for two further open-hearths. Provisionally, it is estimated that this will cost a further £5 million, making in all an amount equal or perhaps greater than that spent by the whole of the foundry industry since the war.

The power-station will develop 25,000 kw. of electricity, and in it are to be seen some noteworthy products of the foundry industry. The output of this huge works is steel sheet, much of which goes into automobile bodywork, but about 10 per cent. is taken for vitreous enamelling. The rolling-mill is quite automatic and continuous, and included in the process is the pickling department. Here it is interesting to learn that the spent acids are sold to paint manufacturers.

German Steel Production Freed

An agreement has been published which removes restrictions on German steel production. It follows the signing in Paris on Friday last of the treaty constituting the European Coal and Steel Community, and is effective from that date. German production has previously been limited to 11.5 million tons a year and plant capacity could not be increased except to maintain technological development. In the first six months of this year West Germany produced 7,334,596 tons of steel. German experts claim that by working a seven-day week and a shift system, annual capacity could be raised by about 16 million tons.

Sharp Fall in June Exports

United Kingdom exports in June, the provisional total of which was estimated at £185,000,000, were 18 per cent. less than in May. Although there were only 23 working days in June, compared with 27 in May, this should account for a reduction of only about 15 per cent. There was a sharp decline in exports in the second quarter, from £718,400,000 in the first quarter, to £628,000,000. Exports were, in fact, lower than in any quarter since the first of last year. For the half-year, exports totalled £1,346,400,000, compared with £1,399,700,000 in the second half of last year; the volume of exports was slightly lower than last year.

Imports into the United Kingdom in June were again lower, totalling £276,700,000, or 14 per cent. less than in May. For the first half-year imports were £1,903,300,000, compared with £1,856,400,000 in the same period last year, and £2,057,800,000 in the second half of 1951. The reduction compared with the second half of last year was due mainly to a fall in volume.

Exports to the United States in June were £11,600,000, bringing the total for the first half-year to £70,900,000, which is much the same as last year. Exports to Canada failed to make the recovery in the second quarter that they made in the same quarter of 1951, the total for the half-year being only £55,300,000, compared with £69,300,000 in the first six months of 1951.

Welding Hazard

At an inquest on July 23, arising out of the death of two persons in an accident at B.K.L. Alloys, Limited, the Birmingham City Coroner (Mr. George Billington) warned operatives using welding apparatus never to rest their work on a sealed container because of the risk of the rising air temperature inside causing the container to explode. The evidence showed that an expert welder employed by the firm was demonstrating electric-arc welding to an engineering student and was using a half-empty sealed drum on which to rest his work. Pressure of hot air inside the drum caused it to burst, fatally injuring both parties. It was made clear that the accident did not result from any explosive substance in the drum and there was no question of the welding machine being responsible. The welder was demonstrating for 20 min., using a metal plate on top of the drum. The increase of temperature raised the pressure inside the drum and when the top of the drum blew out it threw up the metal plate. The accident would not have happened had the welding been done on the floor or on a bench, stated the Coroner.

The British Standards Institution announce the issue of two new and three revised standards. The new ones are for rolled copper sheet and strip for general purposes (B.S. 899:1952), and for electro-plated coatings of tin (B.S. 1872:1952), both at 2s. 6d. The revised standards are for raw copper (B.S. 1035-40, 1172-4 and 1961:1952), and are included in one booklet containing ten standards for raw copper (price 4s.).

BECAUSE OF REDUCED EXPORT DEMANDS, Petters, Limited, engineers and oil-engine builders, of Staines (Middx.), and Bryce Fuel Injection, Limited, also of Staines, have decided to dismiss between 300 and 350 employees in order to revert to a five-day working week for the remainder of their workpeople, who have been on a four-day week basis for a number of weeks.

Aluminium Matchplate Patterns by the Pressure-cast Plaster Process*

This Paper was given in two sections. The first describes the American set-up which was examined by the Authors (who were members of the Brassfoundry Productivity Team) and the second describes and illustrates the process as it has been developed in this country.

I. American Practice

By E. C. Mantle, M.Sc.

Looking back over the visit of the Brassfoundry Productivity Team, it can be said that the only really important technical point encountered in the United States where there was a wide divergence from practice in this country was in the use of pressure-cast aluminium matchplates for machine moulding, made by the process to be described. It is certain that this process is of extreme importance, and that the Conference should give very careful consideration not only to the use of the technique for making pattern equipment, but also to the possibility of adopting matchplate methods of machine moulding as standard practice. During the Conference much will be heard about the high rates of production achieved in America. The influence of piecework and incentive systems will be mentioned. The part played by good-housekeeping and the simplicity and neatness of the layout of the American foundries will also be dealt with. All these factors have their part to play, but it is suggested that the high output of American foundries as well as their neatness and simplicity of layout depends to a very large extent on the fact that the Americans have adopted matchplate moulding as a standard method of production. It was used extensively in every foundry visited.

It is further suggested that the high productivity of the piece-worker is due less to the incentive system than to the organization of the flow of work which the piece-work system demands. The incentive provided by the piece-work system naturally calls for some extra effort, but the Author is convinced that it is not by any means the only or even the most important reason for the increased output obtained. For the successful operation of piece-work system, work more or less on a mass-production basis must be arranged. The job must be turned into a repetition one, and it is difficult to arrange a successful piece-work system with all its advantages unless the method of production can be largely standardized. In a foundry, this really boils down to a standardized method of moulding. Once the bulk of the production can be dealt with by a standard moulding procedure, then efficient planning of the flow of work through the foundry

* Presented at the Brassfounders' Productivity Conference at Harrogate.

FIG. 1.—*Master-pattern for which a Matchplate is required. Every Detail is reproduced and High Accuracy is essential.*

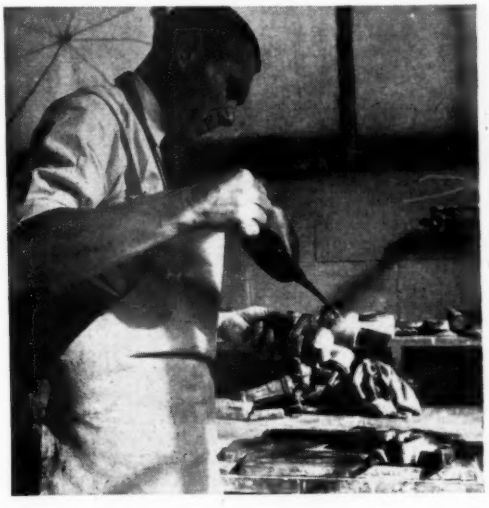


FIG. 2.—*Covering the Pattern and Plate with Light Machine-oil which serves as a Parting Medium.*

FIG. 3.—*Excess Parting Oil is blown out of Pockets on the Pattern by a Compressed-air Blast.*

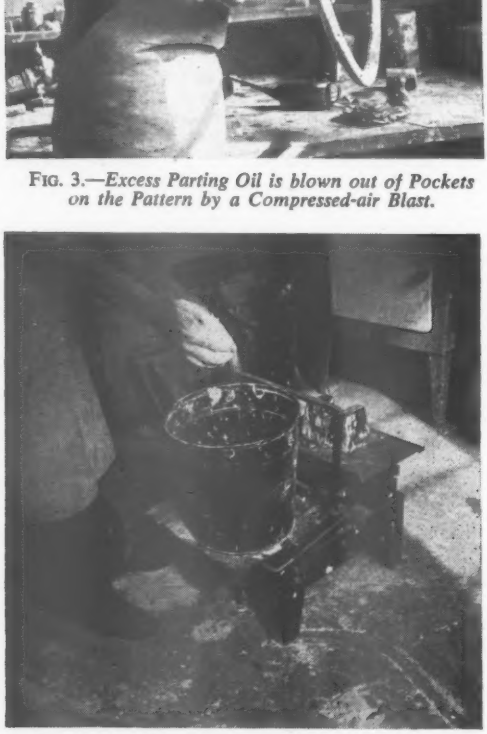


FIG. 4.—*Special Plaster for Metal Casting is first weighed-out and the Water Addition is measured.*

follows naturally, and as a result high rates of production can be achieved. This standardization of moulding procedure, particularly as applied to jobbing foundries is something which British founders can learn from the Americans if their high productivity is to be emulated. It is in this technique of making even a small foundry doing a variety of jobbing work into a mass-production plant where they excel, and it is this technique that the British must acquire.

FIG. 5.—*Adding the Powdered Plaster to the Water for Proper Mixing and to avoid Lumps.*

King-pin of the System

The key to the whole system is the method of pressure casting aluminium patterns in plaster moulds. By this process, matchplates of high quality can be made so cheaply, particularly in relation to American wage rates, that it becomes economic to have a plate made and to set up a job on a moulding machine for even quite small runs of castings. It seemed to be the standard practice to use these plates for small and medium-size castings for runs of 100 off and upwards. To the best of the Author's knowledge, matchplate moulding is not used very extensively in this country in conjunction with moulding machines. Here, it is generally preferred instead to work two machines in tandem with one man making the top-box and a second the bottom and a third man coring and closing, and it may be wondered why the Americans have standardized on matchplates. With this system, one man makes a complete mould in a single cycle of operations. He makes the top- and bottom-boxes in one operation, cores up and closes the mould himself. Thus the one man and his moulding machine then becomes a simple mass-production unit and a whole foundry can be built around this simple unit by just multiplying the unit as many times as necessary to get the required output. Their machine-moulding sections are, therefore, simple in layout, cheap to instal, and relatively flexible.

The rate of output of the machine moulders using this system varied with the type of work, but an average of 160 complete boxes per 8-hr. day was typical. Where there was no coring, the rates were sometimes as high as 220 boxes per day. These outputs may not be so high per machine as is sometimes achieved in true mass-production foundries, with moulding machines working in

pairs, but it should be remembered that these figures refer to the outputs of simple one-man production units, the sort of units that even the smallest jobbing foundries could afford to instal.

Availability of Matchplates

For the success of the system, however, it is essential that cheap matchplate equipment is available. A notable difference between the American foundry industry and our own is that few of their foundries have their own patternshops and these aluminium matchplates are therefore made by specialist firms. The itinerary which had been mapped out for the Productivity Team by the American section of the Anglo-American Council on Productivity did not include visits to firms making matchplates, but at the Foundry Convention held in Cleveland, which the team attended, two manufacturers of these matchplates had stands. The writer and his co-Author, Mr. D. Potts, were subsequently invited to the plants of these two firms—Scientific Cast Products of Cleveland and Accurate Match Plate Inc. of Chicago. The managements of these firms were most co-operative, allowing the visitors to roam at will over their plants, and even to take photographs of different stages of the process. The section of the Brassfounders' Report dealing with the production of aluminium patterns is a detailed account of what was seen. It is felt that the description of the process given in the Report is self-explanatory and it is not proposed to describe it in detail here, but Mr. Potts will be recounting in the second section of this Paper his experiences in reproducing the process.

Output

The specialist firms in America were producing aluminium pattern equipment—they made matchplates, single-sided plates and core-boxes all by the same process—of a high standard and at a very fast rate. Their output was about one plate, together with the necessary core-boxes, each day for every operator employed, and they were able to sell a matchplate about 15 by 14 in. having several pattern duplications for only $45. At the current rate of exchange this is about £15, but it must be remembered that wage rates in America are at least three times those here, so that the real equivalent price in this country would be much lower.

FIG. 6.—*The first Half-pattern is placed in Position on a Cast-iron Plate, held down by a Nail projecting through a weighted Strip of Wood.*

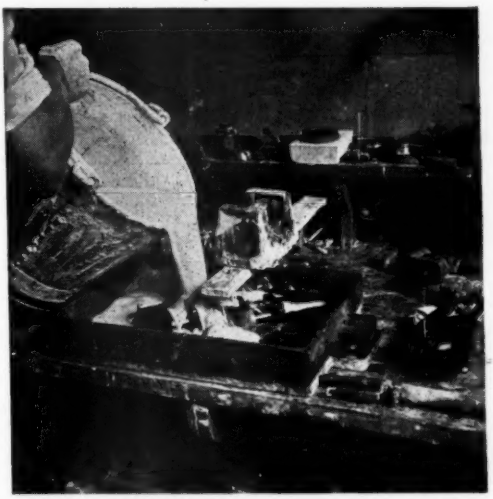


FIG. 7.—*Adding the Plaster Slurry to form the first Half-mould. Setting takes about* 15 *to* 20 *min.*

FIG. 8.—*The Bottom-half Mould is turned over, touched-up on the Joint Face and Parting Oil applied.*

FIG. 9.—*The Top-half Mould is prepared above the completed Bottom-half. Additionally, the Running System can be incorporated.*

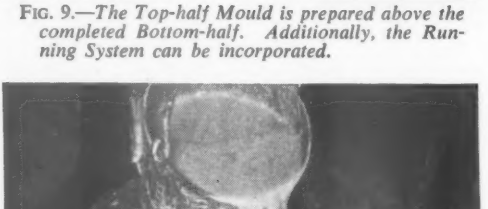


FIG. 10.—*Plaster Slurry for the Top-half Mould is added. The Peg for the Down-gate is clearly visible.*

This low price is due to the fact that practically no hand finishing is needed on the patterns. The plaster-casting process is capable of reproducing the master pattern with extreme accuracy and imparts an excellent surface finish to the cast aluminium pattern-plate.

From the two visits made to the specialist firms making matchplates, it was obvious that the success of the process depended entirely on the availability of a suitable metal-casting plaster. On return to this country, the Authors approached the Gotham Company to find out whether they could supply the correct type of material. This company has co-operated whole-heartedly in supplying plasters for experimental purposes, and from the results which Mr. Potts has to show it is considered that they are able to produce a metal-casting plaster in every way satisfactory for the purpose. There is, therefore, no technical reason why founders should not adopt this patternmaking process in this country.

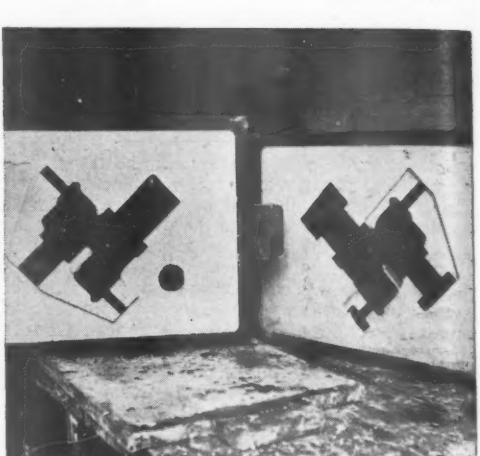


FIG. 11.—*Separated Half-moulds, showing the Step-joint formed on each, and the Downgate Peg in the Top-half.*

II. British Developments

By D. H. Potts

During the past nine months the Author has carried out a series of experiments on matchplate production in collaboration with the Gotham Company, Limited, who supplied the plasters, following step by step the instructions given in the brassfounders' Report. From the results obtained it is considered that individual aluminium patterns, corebboxes and matchplates can be produced successfully by this process using British plasters. The success of the process may be judged from the pattern equipment illustrated in what follows, and the times taken to make it. For instance, the matchplate, the making of which is completely described, was made entirely (excluding stoving) in 4½ hrs., in spite of working with rather crude equipment and the job being only in an experimental stage.

The Brassfoundry Productivity Report is considered to give a very detailed account of the process, but to amplify it this step-by-step account of the making of a matchplate with a single impression, half on either side, is recorded:—

FIG. 12.—*Extracting one of the Half-patterns from the Plaster by means of an Air Jet from behind through the Nail Hole.*

FIG. 13.—*Cutting the Running System in the Top-half Mould leading from the Down-gate.*

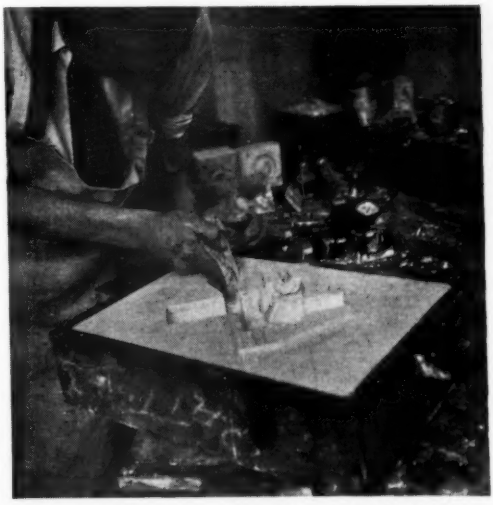


FIG. 14.—*Cleaning up the Bottom-half Mould with a Damp Cloth; both Halves are subsequently Vented.*

Pattern Selection and Preparation

A master pattern for which the matchplate is required is first examined for finish (Fig. 1). It is essential that the pattern is of a high standard, as the process will faithfully reproduce any blemishes. Even the wood grain will be reproduced, and for this reason it is best to use mahogany patterns which have been given several coats of good-quality water-resistant clear varnish. The pattern is next covered with a parting liquid to prevent the plaster sticking to it (Fig. 2). A light machine-oil serves the purpose, although mixtures of tallow and liquid soap have been tried. The cast-iron plate shown in the foreground of Fig. 2, on which the pattern is to be placed, must also be smeared with the parting agent and, finally, excess parting liquid is blown out of any deep pockets, as shown in Fig. 3.

Metal-casting plaster being mixed is shown in Figs. 4 and 5. It is important that the plaster and water be in the correct proportions and the plaster must be sprinkled into the water to prevent the formation of lumps, and the whole then stirred up to make a thick slurry. For the mixture, 125 parts by weight of water to 100 parts of plaster is suitable and only sufficient plaster as will be used on each mould should be prepared at a time.

In the next operation, shown in Fig. 6, the first half-pattern (for the bottom-half mould) is positioned on the cast-iron plate and made ready to receive the plaster. In this case, a step-joint has to be formed and a shaped piece of wood has been inserted between the pattern and the plate. The pattern is weighted down to prevent the plaster slurry getting underneath, and this is best done by driving a nail through a piece of wood until it just touches the pattern, and placing a weight on the wood. On running-in the plaster, the nail provides a hole which subsequently is used to strip the pattern from the plaster.

Making the Half-moulds

The bottom-half mould is then made (Fig. 7) by pouring the plaster slurry on to the pattern. Care must be taken not to entrap air, and it helps if the plaster is poured directly on to the pattern as shown. The plaster is then allowed to set—an operation taking approximately 15 to 20 min. Next, this half-mould is turned over (Fig. 8) and the joint touched

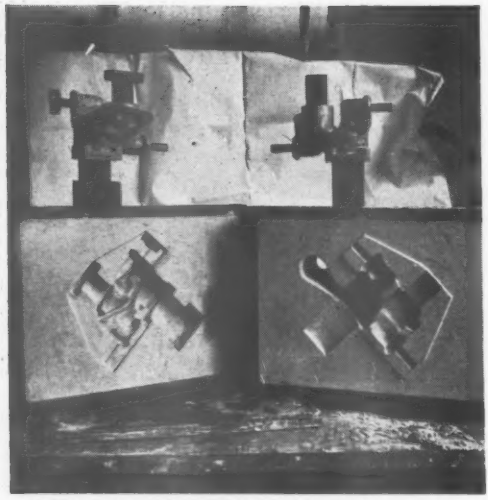


FIG. 15.—*Completed Half-moulds ready for Stoving; the Half-patterns are shown above.*

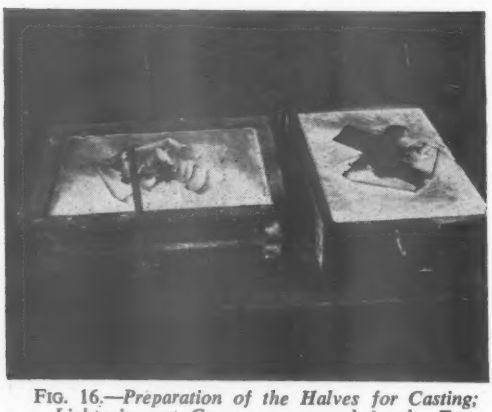


FIG. 16.—*Preparation of the Halves for Casting; Lightening-out Cores are secured in the Top-half.*

up if required; the face must also be smeared with a parting agent. The top-half mould is then made ready (Fig. 9), following the same procedure as for the bottom-half, and any gating system required on the production plate can be cast in. The peg former for the downgate is clearly in the illustration. Fig. 10 shows the top-half being poured.

Mould Finishing and Stoving

In Fig. 11, the mould is shown as made and parted, the step-joint being clearly visible, and in Fig. 12 the pattern is shown withdrawn from the plaster. An air nozzle is then placed in the small hole made by the nail and the air pressure breaks the vacuum between the pattern and plaster, and the pattern pops out. No rapping is necessary, and the impression is therefore a very accurate reproduction of the master pattern. Subsequently, the gating system can be cut to the downgate and cleaned-up by wiping with a slightly damp, clean cloth (Figs. 13 and 14). It has been found that the best results are obtained if the mould is vented slightly. Only one or two vents are required off the high points of the pattern. These are made by pushing a thin vent wire through the plaster.

The mould halves completed and ready for stoving are shown, with the half-patterns above, in Fig. 15. As the firm has no special equipment for the process, all stoving so far has been carried out in the ordinary type of large foundry mould stoves. Stoving is carried out for 12 hrs. at 205 to 215 deg. C. (400 to 420 deg. F.). After stoving, the mould is made ready for casting. The bottom-half, shown on the left in Fig. 16, is placed on a bottom-board and on top of the bottom-half a steel frame is positioned to form the thickness, length and breadth of the matchplate. In the top-half mould (Fig. 16, right), lightening-out cores are shown in position. An individual corebox is not required for these cores, as they are employed only to lighten the plate and keep the metal sections as even as possible. A production core was used in this case and roughly filed to shape. The cores are vented and held in position by two or three steel tubes which have been let into and gummed in the cores. Corresponding holes are drilled into the plaster mould; these are made a tight fit on to the tubes and by this means the cores are both held in position and vented. The tubes form small holes in the final metal pattern, but as these have been formed by steel tubes of a standard diameter, they can be quickly tapped and plugged.

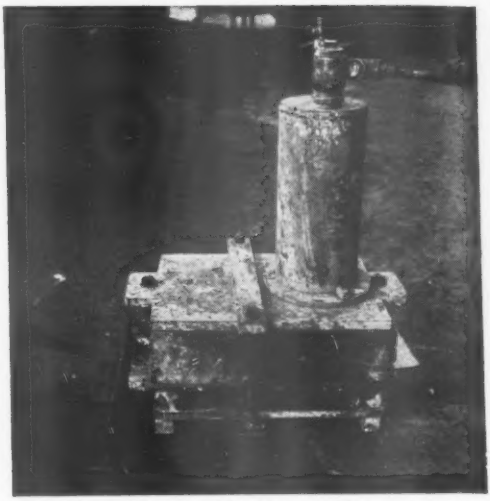


FIG. 17.—*Three-part Mould assembled and, with the Receiver added, ready for Casting.*

Assembly and Pouring

The mould is next assembled and made ready for pouring (Fig. 17). On the top-half mould, scratch

FIG. 18.—*Pouring Aluminium (L.33 Alloy) into the Receiver, which is subsequently closed and Air Pressure applied.*

FIG. 19.—*Matchplate cast and the Mould opened ready for Knocking-out.*

vents have previously been made to connect with the tube vents from the cores so that air can be taken off between the top-half mould and the top plate. On the top plate a receiver is fixed which has previously been lined with approximately ½-in. thickness of metal-casting plaster. Between the receiver and the mould, an asbestos sheet (approximately $\frac{1}{32}$ in. thick) is placed covering the downgate. A low-pressure airline is attached to the top of the receiver and the mould assembly is then completed and the job ready to be cast.

Metal is poured into the receiver (Fig. 18), which is then closed, and air at 5 to 6 lb. per sq. in. is introduced. The metal then breaks the asbestos-sheet seal and flows into the mould, still under an air pressure. Casting temperature should be kept low, 600 to 620 deg. C., and even at this low temperature the metal will remain molten for about 15 to 20 min. when L.33 alloy is used.

Fig. 19 shows the matchplate as-cast and ready to be stripped from the mould, and in Fig. 20 this has been effected; in the left-hand view, the matchplate is as-stripped and no touching-up has been done, the somewhat rough appearance being due to plaster adhering to the plate. The two tubes are the core supports and vents mentioned in the reference to Fig. 16. The mould vents, three in number, can also be seen. It is interesting to note that the pattern-maker's centre-lines on the wooden master-pattern

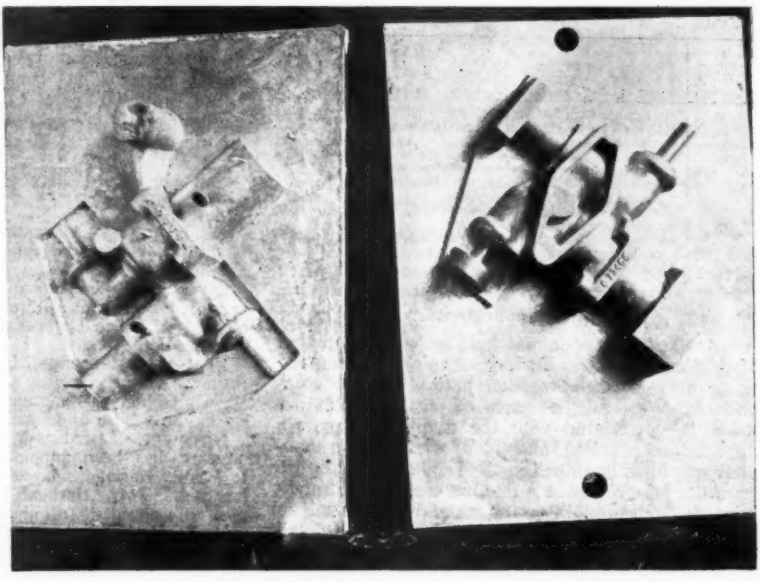


FIG. 20.—(*left*) *Top-side of the Matchplate as stripped from the Plaster (Rough Appearance is due to adhering Particles of Plaster), and* (*right*) *Bottom-side of the Matchplate after Wire Brushing only.*

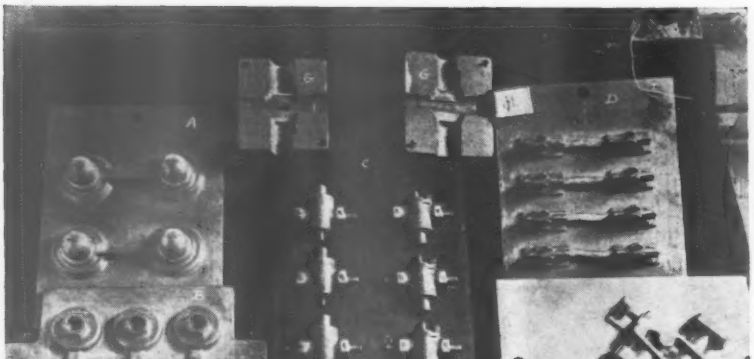


FIG. 21.—*Group of Pattern Equipment produced by the Process. (See Table I for Details and Times required for Manufacture.)*

have been reproduced on the left-hand boss. The right-hand view (Fig. 20) shows the same plate after it has been wire-brushed only, with no other finishing.

Some of the various equipment made by this process is shown in Fig. 21. To give some indication of the speed by which pattern equipment can be made by this means, typical actual times taken to make these patterns (excluding stoving time) are quoted in Table I.

TABLE I.—*Actual Times for Making Matchplates. (See Fig. 21).*

Mark in Fig. 21.		Total time (hrs.).
A	Matchplate with four impressions	5
B	Matchplate with six impressions (this was the first plate made)	8
C	Single-sided machine-moulding plate of cast iron (made by normal methods) on which were mounted six aluminium patterns made by the pressure plaster process	4
D	Matchplate with eight impressions	5
E	Matchplate with single impression	4½
F	Loose pattern for mounting on machine-moulding plate	3
G	Aluminium core-box	3

Other Applications

Using this method, matchplates with a number of duplications (as in D, for example) can be made using only a single wooden pattern of the component. With this, a series of small moulds are made to correspond with the number of pattern duplications required, and then formed into a complete mould as described in the Productivity Report. Irregular joint-lines are formed as easily as a straight joint, by first moulding on to an odd-side instead of a plate. This stage is also described in full detail in the Report.

Individual patterns can also be made from a single master-pattern (as in C, Table I, for example) and then mounted in the usual way. Bearing in mind that no rapping is required to withdraw the pattern, and relatively no finishing is required, each pattern so mounted is a very accurate reproduction of the original wooden master-pattern. All core-prints are, therefore, identical in size and little difficulty is experienced in coring-up.

Finally, it is considered that by using this method, pattern equipment suitable for machine-moulding, using either single-sided plates or matchplates and coreboxes for suitable core-blowing, can be produced much more cheaply than by previous methods. This should enable the jobbing founder, handling small runs, to mould by machine and make cores by blowing for relatively short runs, and it is for this reason that the times to make the equipment illustrated have been published.

Acknowledgment

All the experimental work on this process of producing patterns has been carried out at Westinghouse Brake & Signal Company, Limited, and the Authors gratefully acknowledge permission to publish the account, as well as the actual times taken.

Board Changes

DE HAVILLAND AIRCRAFT COMPANY, LIMITED — Mr. Archibald Stewart Kennedy, secretary, has been appointed to the board.

LAYCOCK ENGINEERING COMPANY, LIMITED—Mr. M. G. H. Brown, a director of Birfield Industries, Limited, of which Laycock Engineering is a subsidiary, has joined the board.

VICKERS-ARMSTRONGS, LIMITED—Mr. T. Gammon, manager of the company's Weybridge works, and Mr. W. D. Opher, works superintendent of the Crayford works, have been appointed additional directors.

NU-SWIFT, LIMITED—Mr. F. Graucob, managing director, has been appointed chairman in succession to Mr. A. Harland, who has resigned owing to advancing years. Mr. Harland has accepted the honorary post of president of the company. Mr. E. E. C. Cawood, general manager, has been appointed technical director.

Correspondence

[We accept no responsibility for the statements made or the opinions expressed by our correspondents.]

SYNTHETIC RESINS IN THE JOHN HARPER FOUNDRY

To the Editor of the FOUNDRY TRADE JOURNAL

SIR,—The interesting paper by Dews and Drury which you published on May 22 may be a little misleading to some of your readers, particularly if they do not fully appreciate that the emphasis in the title should be on the words "John Harper."

As manufacturers of both urea-formaldehyde and phenol-formaldehyde resins, we have no interest in extolling one type of resin to the disadvantage of the other. We know from experience in many foundries that U.F and P.F resins both have their merits, one being more suitable than another according to the specific foundry conditions. Without in any way criticizing the validity of the statements made by the Authors, we do consider that they need much qualification before being applied to other foundries. For instance, the statement is made in the second paragraph that "both phenol-formaldehyde and urea-formaldehyde resins have been investigated and without doubt the U.F resins give the best results." There are many other foundries which would be equally emphatic in favour of P.F resin. The Author's continue: "U.F resins are much cheaper and in some respects have greater applicability, and at the present time are much more readily available." It is true that the price per pound of liquid U.F resins (50 per cent. solids) is only about two-thirds of the price per pound of liquid P.F resin (70 per cent. solids). What counts, however, is the overall cost; and because the newer types of P.F. resin economize in cereal by themselves imparting significant green-strength, they are often in effect as cheap as the lower priced P.F.'s. In terms of applicability in relation to the foundry industry generally (rather than to the particular foundry of John Harper & Company) there is surely no room for doubt that P.F resins have the advantage. P.F resins are being used to bond cores for all types of metal castings from light alloys at the one extreme to 20-ton steel castings at the other. For heavy-section steel, iron, and copper-base alloys, P.F resins are undoubtedly better; for cores needing minimum gas content, P.F resins are far superior. Where baking conditions cannot be closely controlled, P.F resins can be used as easily as oil, whereas U.F resins are very liable to be overbaked.

As to availability, it is true that there was some shortage of phenol six months ago, but this has never prevented the supply of P.F resins to the foundry industry, where the consumption of resins does not yet amount to a significant proportion of the current resin production. Where U.F. resins score is in easy knock-out and in their greater efficiency in terms of dry-strength per unit weight of resin solids. With some difficult sands, we have found U.F resins far superior to existing types of P.F resin.

We trust these comments will help to restore the balance, so that prospective users of resin binders will give equally careful consideration to the merits of each type of resin in relation to their own particular requirements.

Yours, etc.,

P. G. PENTZ,

Technical Sales Manager,

Leicester, Lovall & Company, Limited.

July 21, 1952.

Refresher Course for Works Engineers

For the first time in the eastern region, works engineers are to have an opportunity to obtain up-to-date information about efficient utilization of heat and power. This is being offered through a special refresher course which is being organized by the Ministry of Fuel and Power at the Cambridge University Engineering Laboratories from September 22 to 26.

A number of lectures by specialists will be included in the course, and among papers being given will be those dealing with steam, gas, and electricity utilization; economical use of compressed air; application of heat pumps and gas turbines; insulation of buildings and hot surfaces; boiler plant operation and instrumentation, refrigeration plant usage; heating, hot-water supply, and ventilation; boiler-feed water treatment and self-generation of electricity and use of exhaust steam.

Further information concerning the course can be obtained from the Fuel Efficiency Secretary, Ministry of Fuel and Power, Brooklands Avenue, Cambridge.

Iron-ore Imports

Imports of iron ore in June and the total for the first six months of the year, with comparative figures for 1951, are shown below.

Country of origin.	Month ended June 30.		Six months ended June 30.	
	1951.	1952.	1951.	1952.
	Tons.	Tons.	Tons.	Tons.
Sierra Leone	40,890	60,700	244,106	382,642
Canada	51,135	104,940	71,885	231,595
Other Commonwealth countries and the Irish Republic ..	2,091	2,418	12,969	13,355
Sweden	207,748	295,943	1,427,515	1,743,862
Netherlands	8,769	7,022	13,680	13,962
France	36,567	30,226	205,202	216,116
Spain	64,000	58,099	403,005	365,176
Algeria	117,727	120,970	630,336	863,346
Tunis	32,910	46,140	231,180	269,251
Spanish ports in North Africa	26,350	19,000	176,957	164,617
Morocco	28,390	21,185	128,665	143,117
Other foreign countries	27,899	58,464	67,704	199,838
TOTAL	644,476	825,107	3,613,204	4,606,877

Japanese Iron-ore Imports

Six months ago the Japanese steel industry planned imports of about 5,000,000 tons of iron ore for 1952. Since then world demand has fallen and as a result the Japanese industry fears that it is likely to be left with about 1,000,000 tons of iron ore in excess of its requirements during 1952. The iron and steel manufacturers are therefore attempting to re-negotiate their iron-ore import contracts with the suppliers in the United States, the Philippines, Malaya, and India.

Railway Carryings

The latest weekly tonnages of coal, iron, and steel carried by British Railways were up not only on the figures of the preceding week, but also on the corresponding week of last year. Iron and steel conveyed from the principal works during the week ended July 12 amounted to 193,065 tons.

Parliamentary

Salesmanship and the Export Trade

A motion exhorting the Government to see that firms producing goods required by Commonwealth and foreign countries now and in the future had every encouragement and that every facility was given by departments and private firms to offer these goods in such ways as to produce maximum export sales, was moved by COL. J. H. HARRISON.

Col. Harrison said that the Chancellor of the Exchequer had informed him that last year 87,000 salesmen went abroad taking £9,000,000 of foreign exchange. If one worked that out in relation to the whole volume of our export trade, it would be found that it was only 0.25 per cent., and that roughly what had been spent on solesmen going overseas was only £2 10s. per £1,000 of the sales they achieved. That was a very small percentage and was far too low. It was when times were good and selling was easy that we should have had as many representatives as possible going out into these foreign countries.

Above all, it was important to place a good picture of the goods we were selling before those who were buying, particularly in the rising and expanding markets which would exist for many years to come in Asia and Africa.

The SECRETARY FOR OVERSEAS TRADE (Mr. H. R. Mackeson), in reply, said that so far as he was aware, there had been practically no complaints that currency restrictions had stopped salesmen going abroad. Col. Harrison had referred to some 87,000 people having gone abroad. But, of course, he must bear in mind that that number related only to salesmen, directors, and employees concerned with industry going to foreign countries as opposed to the sterling area countries. If that was doubled—because, in fact, about half our trade was with the sterling area—he would find that there were about 174,000 people leaving these shores for commercial purposes. As to the trade attachés and consuls, he was a little surprised at the criticism. He could hardly agree with the principle of payment by results in this instance, although, of course, it was an original idea. The object of these officials, and the reason for their employment, was to advise the Government, and particularly the Board of Trade, on trading conditions so that if any firm or association wanted advice, it could go to the Board of Trade officials and get it and, when people went abroad, these officials were there to provide broad assistance by way of introductions and to advise on the trading problems in the country concerned. It was not the task of these officials to sell; that was essentially a matter for industry.

Government Sales of Raw Materials

Selling prices of those raw materials which were still bought and sold on public account kept closely in line with the free market prices in all cases where there was a generally accepted free market price, said VISCOUNT SWINTON, Minister of Materials. Replying to a question by LORD BARNBY in the House of Lords, Viscount Swinton said this meant that the selling prices of such materials were maintained at or about current replacement costs.

Where there was no generally accepted free market price, prices varied according to the source of supply. The selling price was fixed on a basis of cost, that is, the average cost at which the Government was replacing the materials as they were sold.

This was an entire change in Government policy. In the past the policy was the Government must not make a loss whatever happened on any transaction, though it might have made a large profit on a rising market.

Housing Minister's Scrap Appeal

A circular to local authorities in England and Wales asking them to review their salvage arrangements, to ensure that as much iron and steel scrap as can be recovered economically is collected from all available sources and sent to the blast furnaces, has been despatched by Mr. Harold Macmillan, Minister of Housing and Local Government. The circular points out that local authorities, as users of steel for housing and other purposes, will realize how badly every ton is needed today. In spite of salvage arrangements already made in some areas, large quantities of tins and other domestic scrap still remain uncollected.

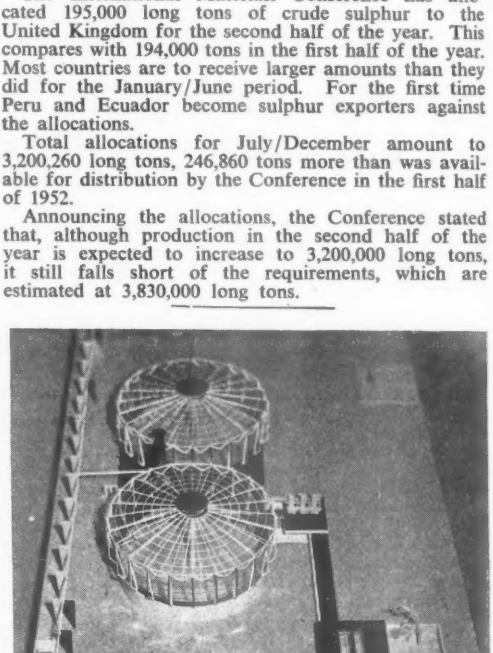
The circular gives details of the current prices for scrap and says that the present demand is likely to continue. It also lists the addresses of the scrap drive committees in the different regions.

Sulphur Allocations Increased

The International Materials Conference has allocated 195,000 long tons of crude sulphur to the United Kingdom for the second half of the year. This compares with 194,000 tons in the first half of the year. Most countries are to receive larger amounts than they did for the January/June period. For the first time Peru and Ecuador become sulphur exporters against the allocations.

Total allocations for July/December amount to 3,200,260 long tons, 246,860 tons more than was available for distribution by the Conference in the first half of 1952.

Announcing the allocations, the Conference stated that, although production in the second half of the year is expected to increase to 3,200,000 long tons, it still falls short of the requirements, which are estimated at 3,830,000 long tons.



Proposed Figure-eight Design for a Foundry, submitted by a group of Fourth-year Students of the Architectural Association School and one of Several Models Exhibited at 34, *Bedford Square, London. The Students of this particular group—J. Winter, K. Jack and R. Smith—have visualized Light and Heavy Foundries under the Circular Roofs, with Common Services between.* (*See* JOURNAL, *July*, 24, 1952, *p.* 88.)

Natural Roof Ventilation for Foundries

By A. R. Parkes

As part of a series of investigations into means of improving working conditions in foundries, the writer recently carried out an investigation of the system developed by Hills (West Bromwich) Limited of power-operated roofing shutters for evacuating fumes and introducing light. This firm over many years has pioneered the development of this means of natural roof ventilation. Upwards of 50 well-known foundries in this country alone have so far been equipped with the shutters—aggregating in total more than 2,000,000 sq. ft. of roof openings.

The system, known properly as Hills Patent Roof Ventilating Shutters*, comprises units of pivoted corrugated sheets arranged in series, usually spanning an opening about 6 ft. deep by 60 ft. in total length. These units are built into new or existing foundry roofs parallel to the ridge. The corrugated shutters, which, in the closed position, form a rain-tight part of the roof, are capable of being opened as a whole by the operation of an electric motor, remotely controlled, and acting through a system of gearing and levers. At the fully-open position, each sheet becomes inclined at an angle of 65 deg. to the normal of the roof. Intermediately, the opening operation can be stopped and positively held at any desired angle up to 65 deg. Fig. 1 shows the schematic layout and Fig. 2 a typical foundry installation from outside. The result is that a section of the foundry roof can be opened to the sky for areas in multiples of 240 sq. ft. and the whole operation requires but 1¼ minutes.

Psychological Effect

The effect is perhaps a little difficult to appreciate from the bald statement of area figures and the writer confirms that it needed a visit to see shutter systems installed in foundry roofs to impress on him the worthwhile nature of the schemes.

Imagine the scene—one approaches a Black Country iron foundry in early springtime; it is a sunny day with fleecy white clouds drifting overhead. From the outside, the foundry roof looks much like any other to the casual observer, except that above the north-light glazing there is a row of unobtrusive corrugated sheets, some small projecting levers, and a walk-way. The roofing glass is somewhat stained with effluent from the cupolas, though not more so than dozens of other foundries, but one guesses that passage of daylight into the foundry is somewhat restricted. On entering the building, this proves to be the case. It is just before lunchtime and the rows of moulds, neatly set out on the floor, have recently been cast-up. The roof is not too high and fumes and smoke from the moulds and cores have collected in the foundry until vision is difficult, even despite some light which does penetrate the roof glass. Eyes water and there is spasmodic coughing among the operators. Then the foreman walks to the wall, presses the equivalent of "Alf's" button and, Hey Presto! the roof opens itself. Sunlight streams in through large areas. Smoke and fumes pour out. In ten minutes the atmosphere is clear. The sight of the fleecy clouds and the shafts of sunlight bring lightheartedness and new energy to the whole personnel. The phenomenon has to be seen to be believed. Even discounting the actual smoke removal, the psychological effect of the roof literally being opened up gives a tremendous surge of well-being.

On cold days, the shutters can subsequently be closed or partially closed or perhaps only opened again for the evening's casting. In summertime they can be permanently open. Seldom, even in driving rain conditions, are they penetrated even when open, and not at all when shut. Fig. 3 shows how light and airy is a foundry interior where a number of sets of shutters are fitted in the roof.

Constructional Details

Fig. 1 also shows the main constructional features. When closed, the individual corrugated shutters lie side by side, after the manner of normal roof-sheeting, but two corrugations overlap each with its fellow. All the structural parts are hot-dip galvanized for protection against corrosion and the sheets are either of Cellactite (that is, a corrugated steel core, thickly coated on both sides by an asbestos/bitumastic weather-proof composition) or of "R.P.M."

* Fully protected by world patents.

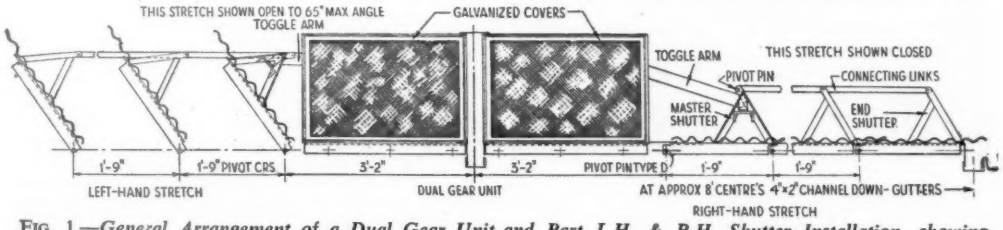


FIG. 1.—*General Arrangement of a Dual Gear Unit and Part L.H. & R.H. Shutter Installation, showing the Method of Construction and Operation.*

FIG. 2.—*Typical Shutter Installation on a Foundry Roof, showing the Central Location of Gear Housings for Each Pair of 30-ft. Openings.*

branded material. The actuating motor is a 1-h.p. unit which can be totally enclosed for specially heavy duty. Then, there is a Renold-chain drive to a sprocket on a steel screwed rod, which effects the movement of the lever system. In emergency, such as a power failure, it is possible to operate the shutters by hand. Each corrugated sheet is mounted in a frame so that replacement, actually most unlikely, could be effected simply. Furthermore, each frame pivots on "Oilite" bearings, thus maintenance is light, though walk-ways for inspection are usually fitted.

FIG. 3.—*Interior View of the Dressing Shop of Midland Motor Cylinder Company's Foundry, with Shutters Open.*

A normal installation consists of two 30-ft. sets of shutters, with a central enclosed motor-house (as shown in Fig. 2). If the roof angle be less than 15 deg., an artificial slope is usually created before mounting the shutters; indeed, flat roofs can be served in this way. This minimum angle is necessary so that rainwater will run down the corrugations and not pass from one to another. At each 8-ft. interval there is a water-channel spanning the shutter gap to take roof-water from above to below the shutter installation.

Site Details and Cost

Every installation is engineered to suit site conditions (Fig. 4 shows the system adapted to an existing slated roof). Prevailing winds, interior inlet ventilation, proximity of other buildings, nature of fumes, etc., all have to be considered. Fig. 5 shows, in diagrammatic form, two types of effective layouts for different roof spans. The cost of the equipment is not high and, as the air movement is "natural," running costs are negligible as compared with "forced" ventilation. If desired, a maintenance contract can be arranged with the suppliers for a nominal figure. A typical first cost is of the order of 16s. 6d. to 27s. 6d. per sq. ft. of roof opening created—which includes installation. This puts a 30 by 6 ft. set at around £250 total cost. Louvre-type, wall-inlet ventilators are manufactured by the same firm, as complementary units to the roof system. With normal foundry roof construction, the safety margin is such that there is no need for strengthening when fitting shutters, the load being taken by the rafter

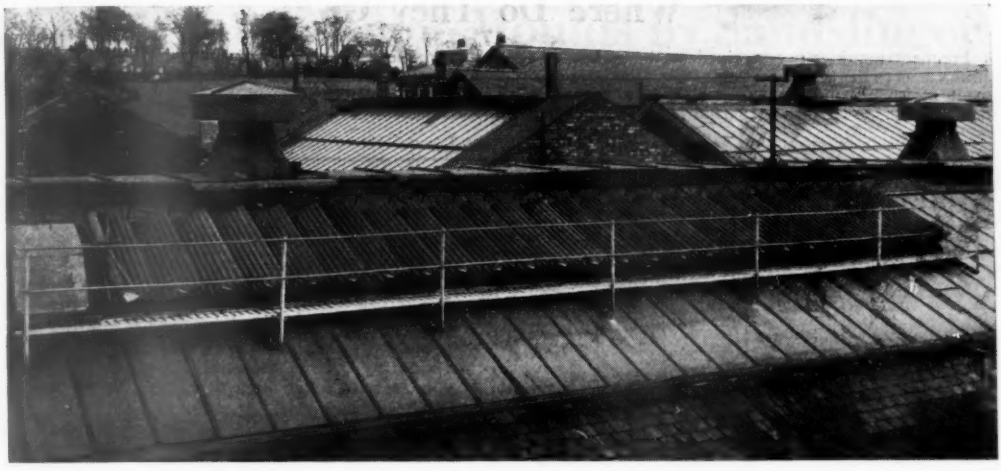


FIG. 4.—*Shutter Installation built into an Existing Slated and Glazed Roof.*

backs on the roof trusses. Total " dead " load is 5.5 to 6.0 lb. per sq. ft. The opening of the shutters on a windy day gives a minimum " live " load because the flow of the wind is directed instead of confined by the shutters.

If further proof were needed of the popularity of these shutters, one has only to glance at the list of British foundry installations—which includes the names of Firth Vickers, Crane Limited, K. & L., Hepworth & Grandage, Fry's Diecasting, and Midland Motor Cylinder. Neither does the writer need to apologise for being enthusiastic on this subject, for after all no excuse is necessary for introducing light into the darkness of a foundry.

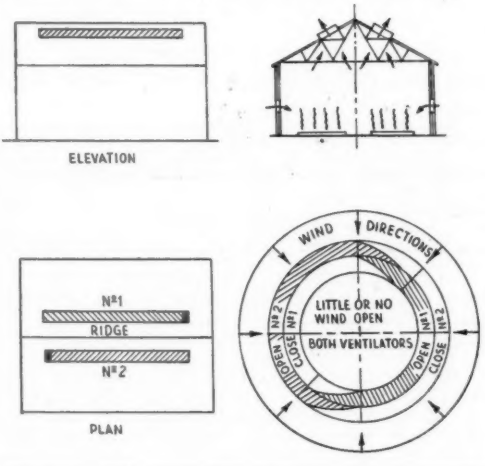
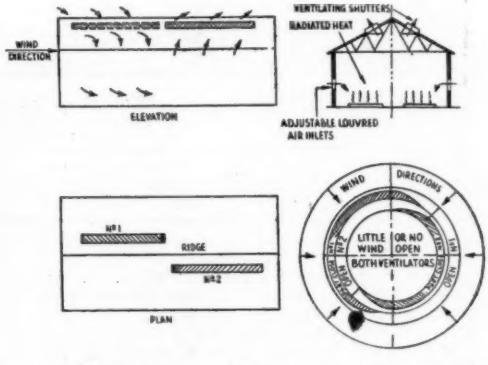


FIG. 5.—*Diagrams showing Two Typical Installations according to Building Size and Shutter-opening Cycles according to Wind Direction.*



THE GAUGE AND TOOL MAKERS' ASSOCIATION is to hold its annual meeting in London on September 29.

ORDERS from 16 Canadian firms and two contracts for the design of new and complex machines which may open a wholly new American market have been brought back from the Canadian International Trade Fair by Mr. Morgan Fairest, director of Morgan Fairest, Limited, machinery manufacturers, of Sheffield.

BIRFIELD INDUSTRIES, LIMITED—Mr. G. P. S. Macpherson has been appointed to fill the vacancy on the board caused by the recent death of Mr. N. D. Newall, the new director, who is a managing director of Robert Benson Lonsdale & Company, bankers, and a director of many investment trust companies, was elected earlier this month to the board of Sangamo Weston, Limited, manufacturing electrical engineers, of Enfield (Middx).

Where Do They Go?

Frequent inquiries are received at the offices of the JOURNAL as to the ultimate destination of the huge assortment of iron castings which are produced annually in this country. As at least a partial reply, Table I below is reproduced by courtesy of the Council of Ironfoundry Associations; it also shows the main trends of production and productivity over the four-year period.

TABLE I.—*Annual Production of Grey Iron and Malleable Iron Castings, 1948 to 1951, and Details of the Main Fields of Consumption.*

Year	1948		1949		1950		1951		Comparison of 1951 with 1950	
Total production of grey iron and malleable iron	Tons. 3,283,901		Tons. 3,388,121		Tons. 3,486,892		Tons. 3,752,451		Tons. +265,559	Per cent. + 7.6
Malleable cast iron only	125,119		120,447		129,511		142,571		+13,060	+ 10·8
MAIN FIELDS OF CONSUMPTION.	Tons.	Per cent. total.	Tons.	Per cent. total.	Tons.	Per cent. total.	Tons.	Per cent. total.		
1 Building and municipal (pipes, gutters, manhole covers, baths, sanitary goods)	206,205	6.28	236,275	6.97	255,671	7.33	263,072	7.01	+7,401	+ 2.9
2 Cooking and heating apparatus, including radiators	207,843	6.32	207,591	6.12	227,829	6.53	247,817	6.60	+19,988	+ 8.7
3 Other domestic appliances	15,573	0.47	12,801	0.37	15,322	0.44	16,298	0.43	+976	+ 6.3
4 Pipes and fittings for gas, water, sewage, etc.	491,714	14.97	545,253	16.09	572,197	13.54	589,556	15.70	+17,359	+ 3.0
5 Coal-mining, quarry, clay and cement plant	63,473	1.93	61,962	1.82	56,204	1.61	62,037	1.65	+5,833	+10.3
6 Gas production	33,227	1.01	34,284	1.01	34,587	0.99	34,635	0.92	+48	+ 0.1
7 Electricity generation and distribution	98,015	2.98	100,387	2.96	95,060	2.72	109,912	2.92	+14,852	+15.6
8 Motor-car and cycle industry	214,523	6.53	215,748	6.36	269,726	7.73	294,157	7.83	+24,431	+ 9.1
9 Railway equipment	316,405	9.63	321,799	9.49	277,638	7.96	330,871	8.81	+53,233	+19.1
10 Shipbuilding and docks	120,925	3.68	115,053	3.39	102,878	2.95	109,518	2.91	+6,640	+ 6.4
11 Prime-movers (turbines, engines) for land use, and transmission machinery	92,852	2.82	102,439	3.02	115,540	3.31	131,728	3.50	+16,188	+14.0
12 Boiler-house plant for industry, etc.	72,880	2.21	74,687	2.20	72,911	2.09	74,709	1.99	+1,798	+ 2.4
13 Agriculture and food processing	194,805	5.93	178,033	5.25	198,342	5.69	213,833	5.70	+15,491	+ 7.8
14 Machine-tools	175,575	5.34	179,813	5.37	180,257	5.16	202,711	5.40	+22,454	+12.4
15 Textile machinery	157,890	4.80	146,845	4.33	134,165	3.87	147,012	3.91	+12,847	+ 9.5
16 Valves, pumps and compressors	46,391	1.41	60,623	1.78	70,731	2.02	82,045	2.18	+11,314	+15.9
17 Chemical plant	24,502	0.74	26,865	0.79	27,367	0.78	26,314	0.70	—1,053	— 3.8
18 Ingot moulds for steel and non-ferrous metal manufacture	302,580	9.21	318,339	9.39	321,647	9.22	334,360	8.90	+12,713	+ 3.9
19 Iron and steel works plant and rolls for mills	88,097	2.68	135,092	3.98	131,584	3.77	132,760	3.50	+1,176	+ 0.9
20 Cranes and conveyors for industry, transport, etc.	32,587	0.99	34,465	1.01	36,302	1.04	37,440	0.99	+1,138	+ 3.1
21 Printing and paper machinery	22,074	0.67	23,151	0.68	29,006	0.86	32,004	0.85	+2,998	+10.3
22 Balance (general engineering and jobbing castings)	259,304	7.89	256,616	7.86	261,928	7.51	279,662	7.45	+17,734	+ 6.8
Total ironfounding labour force (operatives, clerical and management) at end of year	No. 149,981	21.898 tons per man/year	No. 146,211	23.172 tons per man/year	No. 150,329	23.195 tons per man/year	No. 154,215	24.332 tons per man/year	—	
Steel production (for comparison only)	Tons. 14,877,000		Tons. 15,553,000		Tons. 16,293,000		Tons. 15,638,000		—655,000	— 4.0

THE HEAD OFFICE AND FACTORY of C. R. Averill, Limited, graphite refiners and industrial paint manufacturers, has recently been transferred to Alyn Mills, Caergwrle, Wrexham, North Wales (telephone: Caergwrle 14), from London. Production started there on July 7. The company's new London office is at 52, Bedford Row, W.C.1 (telephone: HOLborn 5113).

THE LAUNCHING of a 65-ton dock gate took place at the Naval Yard of Vickers-Armstrongs, Limited, Walker-in-Tyne, last week. The gate, which has been built for the new dry dock under construction at Sunderland for T. W. Greenwell & Company, Limited, is to be specially ballasted and towed to the Wear on August 12. It is one of the biggest gates of its type in the country, measuring 91 ft. by 6 ft., with a depth of 32 ft.

THE PRESIDENT OF THE BOARD OF TRADE, Mr. Peter Thorneycroft, has promised to meet a deputation from the Lancashire and Merseyside Industrial Development Association before taking a final decision whether any Lancashire districts should be scheduled as development areas. The Board of Trade is at present considering this matter.

IN SUBSTITUTION of an order for two 10,000-ton cargo motor-ships placed last January with the Furness Shipbuilding Company, Limited, of Haverton Hill-on-Tees (Co. Durham), Northern Steamships, Limited, of Johannesburg, has signed a contract for two 16,300-ton tankers for delivery by 1958. These owners have also on order with the Furness Shipbuilding Company an oil tanker of 24,500 tons dw. for delivery in 1954, and a 10,000-ton cargo motor-ship for later delivery.

Production of Ingot Moulds by Sandslinger in a Mechanized Foundry*

By J. Raymond Jones

(*Continued from page* 105)

Moulding boxes.—These are made of four plates ribbed on the outside for strength and machined on all outside edges before assembly. The box is bolted together on two diagonal corners, the other corners being clamped and held in position with dowel pins. The bottom flange is drilled to take guide pins (located in the bottom box) and the guide plate. The box is made sufficiently large to allow for 5 in. of sand between the outside of the pattern and the inside of the box.

Core-bar and bottom box.—The core-bar is a vented, cast-iron, hollow tube, and follows the shape of the inside of the mould, allowing 4 to 6 in. of sand all round. The bar is permanently bolted to the centre of the bottom box. The bottom box is like a saucer with a flange around the outside edge and raised in the centre, where it is flanged and recessed to receive the core-bar. The inside and outside flanges are machined as one face. Guide pins are tapped and bolted through the outside flange, so that the guide plate and outside box always return to the same position. This is to ensure that the wall thickness of the mould is identical with the pattern.

Top-box.—This is a plain box, with pockets to hold sand, and covers the mould when casting. It should be noted that special wedge pieces are cast on to allow clamps to be tightened, without use of loose wedges.

Stripping or guide-plate.—This is of steel 3 in. thick for the larger moulds. The plate is similar in size to the bottom box, but has the inside cut out and machined to fit exactly over the pattern, and is drilled to fit over the pins on the bottom box. The plate has also four pins projecting, which in use pass through the flange of the outside box and are cottered in position to carry the sand when ramming has been completed.

Moulding and Coremaking

The core-bar is wrapped with 1-in. dia. straw rope (Fig. 7, right) and the surface is slurried over with a mixture of blacking and sand and then placed in the Sandslinger ramming pit (Fig. 9). The Sandslinger head is then brought over, started, and the recess in the base-part is rammed with sand. This surface is then strickled or levelled over, making it dead true to the machined surfaces of the outside and inside faces of the bottom-box. The guide-plate is then lowered over, and located by the

* Paper presented to the Buxton Conference of the Institute of British Foundrymen, Mr. E. Longden being in the Chair.

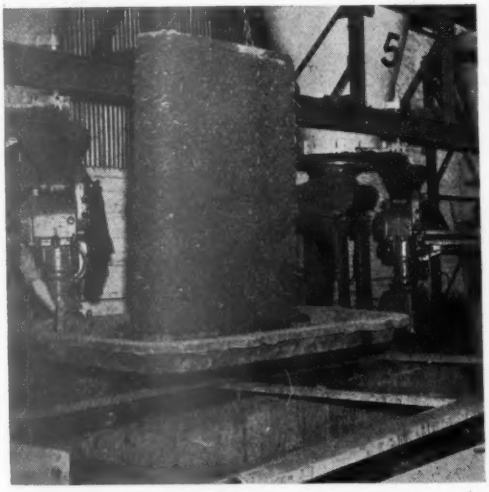


FIG. 9.—*Core-bar and Bottom-box being lowered into the Sandslinger Ramming Pit.*

FIG. 10.—*Core (Integral with the Bottom-box) on the Stove Carriage preparatory to Drying.*

FIG. 11.—*Moulders placing Brads in the Top Box-part of a Mould.*

FIG. 12.—*Closing the Body Part of the Mould over the Core and Bottom Box-part in the Casting Pit.*

pins projecting from the outside flange of the bottom-box. The pattern is next lowered to position, the outside of the pattern just dropping inside the hole in the centre of the guide-plate. The outside-box is then lowered to position, the drilled holes in the bottom flange being located by four cotter-pins projecting from the guide-plate, and also by the two pins which project from the bottom-box. Two runner gates are then positioned at one end, located at the bottom by holes in the guide-plate, and held

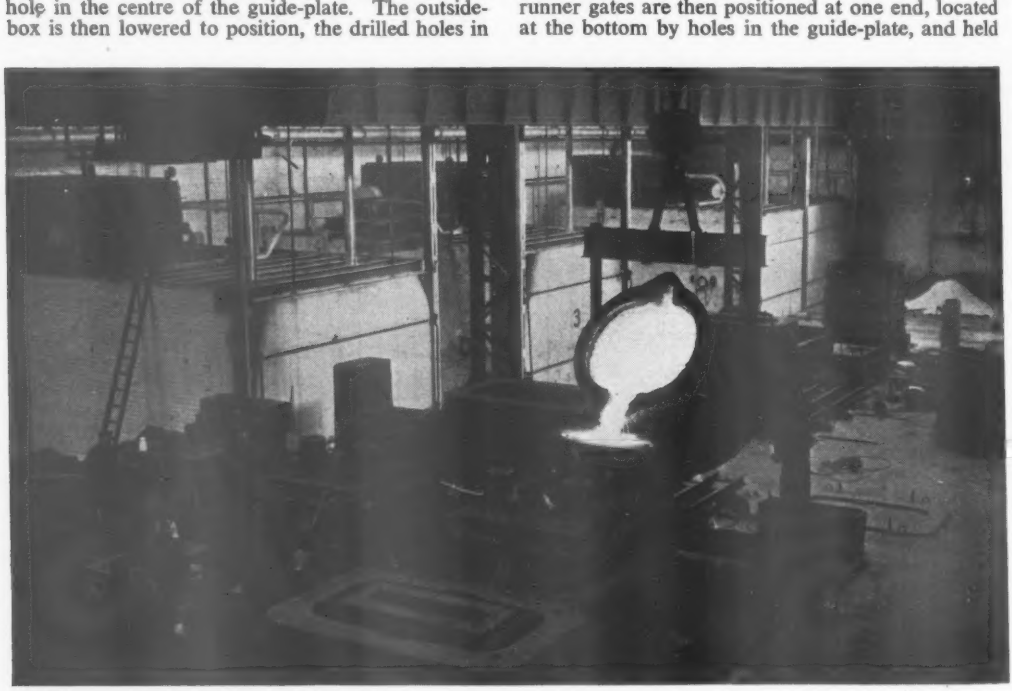


FIG. 13.—*Final Assembly in the Casting Pit and Pouring of Ingot-mould Castings.*

FIG. 14.—*Exothermic Powder being added to the Heads after Casting to Assist Feeding.*

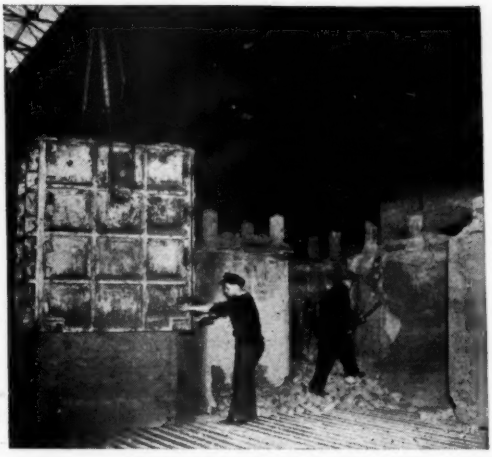


FIG. 15.—*Stripping the Outside-box from the Mould and Casting on the Knock-out Grid.*

in position by a clip at the top. In the very large moulds, that is, those over 18 tons, four down-gates are used, so that two ladles can pour simultaneously from each end. The Sandslinger head is then brought over the gap between the pattern and the outside box, the machine is started, and the head is moved around the gap until the whole area up to the lug is rammed with sand. The lug patterns are next bedded into position, being held by a slot machined in the pattern, and ramming is continued up to the top of the box.

The core is then rammed to within 5 in. of the top; a retaining ring is placed centrally in the sand area, and the core-ramming is completed to the top. This ring is inserted to prevent the core from cracking when moved. The down-gate tubes are pulled out, and the top of the core and outside are strickled so as to give a smooth surface. The outside-box is then lifted, the guide-plate, which is still cottered to it, holding and retaining the sand at the bottom. The outside mould, as it is now termed, is lowered on a rack so that a moulder can get underneath and inside. This moulder cuts the ingates, two from each down-gate, one 6 in. from the bottom and another just above half-way. The inside surface is then smoothed over, the size and number and test-pieces are stamped-in, and the whole surface including the downgates, is coated with carbon blacking to prevent penetration of the molten metal. The pattern is next lifted off, leaving behind the core on the bottom-plate. This is in turn lifted and taken direct to the stove carriage (Fig. 10) where it is dressed and blacked. Top-boxes are rammed by one of the Sandslingers, leaving gaps for the riser-heads and downgates, finally being dressed, blacked and loaded on the stove bogie. The sand in the top-box is strengthened with moulders' brads (Fig. 11).

The stove door is lifted, the stove carriages are pulled out and the core is taken to the casting area (Fig. 12). Before lifting the outside-box, the cotters are taken out of the pins in the guide-plate, the box is lifted and lowered over the core standing on the bottom-box the box being guided to its original position by the pins in the ends of the bottom-box. The flanges of the bottom-box and outside box are clamped together. The top-box is then placed over and clamped to the top flange of the outside-box. The runner-box and riser cups are then put into place, and the mould is ready for casting. From the foregoing, it will be seen that the outside mould goes back to the identical position in which it was rammed, thus the wall thickness cannot vary (Fig. 13).

Metal is brought in from the melting section by means of an electrically-driven transfer car (Fig. 5). The ladle is lifted in the 60-ton overhead crane positioned, and the mould cast. The heads are filled and a proprietory feeding powder is put on the top of each so as to keep the metal fluid (Fig. 14), and assist proper feeding as the casting solidifies.

Stripping

Moulds are removed from the casting area by the night shift from 8 to 12 hrs. after casting; moulds cast very late in the day are emptied not the same night, but the following night. In stripping, the pouring dishes and riser cups are first removed, and the top box eased, and then the whole is lifted by the 60-ton crane. The burdens lifted in the stripping operation are the heaviest of all, because the load comprises the outside box, core-bar, top box and the casting, as well as all the sand inside. A rough estimate is that the tackle weighs the same as the mould, and the sand half the weight of the mould; thus, for an ingot mould weighing 20 tons, the total load would be 20 + 20 + 10 = 50 tons.

The complete mould and boxes are run out to the edge of the knock-out grid and lowered. The clamps holding the outside to the bottom box are removed, and the outside is lifted off, still carrying with it the

FIG. 16.—*Knock-out Grid at Floor Level comprised of Rails resting on Joists and covering a Pit* 100 *ft. by* 40 *ft.*

cast ingot mould, but leaving behind the core-bar and bottom box. The outside box and contents are then lowered to their allocated place on the grid according to the day cast, the clamps holding the diagonal corners of the box together are removed, and the box is again lifted (Fig. 15). The box opens outwards, the two diagonally opposite corners sliding on the dowel pins, which have retaining collars to stop the box opening too far. This parting of the box allows the mould, surrounded by a jacket of moulding sand, to remain on the grid. The outside box, bottom box and top box are then placed in a handy position near the Sandslingers for reuse the following day.

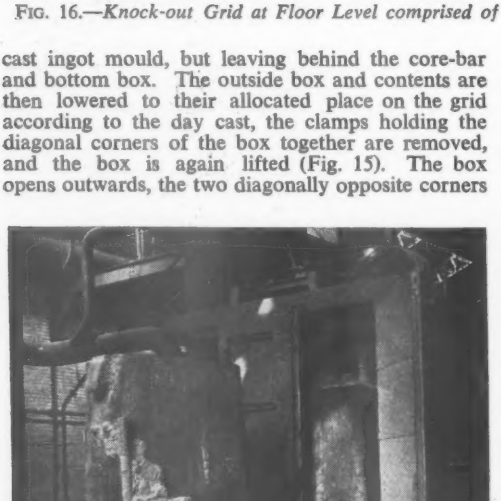


FIG. 17.—*Mould Castings carried on Rail Bogies passing through the Wheelabrator Plant.*

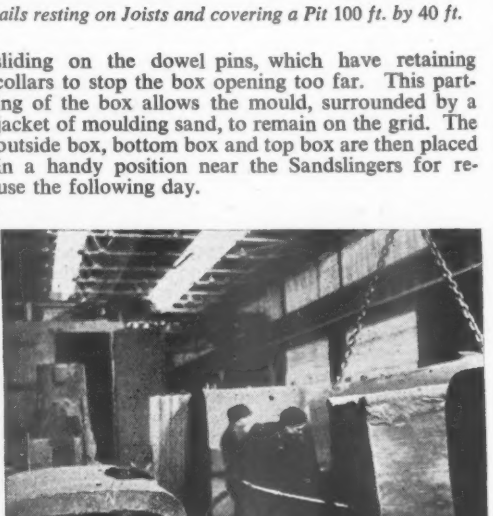


FIG. 18.—*Cleaning Moulds by Pneumatic Chisel in the Dressing Section.*

FIG. 19.—*Loading Finished Ingot-mould Castings into Rail Trucks in One of Three Sidings serving the Despatch Section.*

Knock-out Grid

The knock-out grid (Fig. 16) is composed of rails at floor level lying on girders over a pit approximately 100 ft. long by 40 ft. wide. Under the grid are five sets of troughing which guide the sand to the conveyor belts beneath. The length is such that one full day's cast of 200 tons can be placed over each belt. There are five belts, and this allows a full week's cast (1,000 tons) to be carried on the grid.

Each day's cast is left to cool slowly for a week, so that each belt can be used in turn and always allow a week's cooling. This is essential for relieving stresses set up when casting and makes for a good structure of the mould casting. Also, the sand, when subsequently knocked-off, is cool and does not burn the belts. When the sand is eased off the mould with a bar (Fig. 15), it falls through the grid and on to the belt underneath, and by a series of additional belts is conveyed to the main storage bins or working hoppers over the sand mill. In its travel, tramp iron is removed by Overband magnets and rough material is removed by a rotary screen. This coarse material, mainly burnt sand, is fed on to a waste-sand belt and conveyed to hoppers outside the building and is taken by lorry to the tip. During the above operation, the part of the grid that the sand is being pushed through is under exhaust suction, so that all dust is drawn away. This also applies to the screen, elevators, conveyors, etc., thus implementing the "Garrett Report" on cleanliness in foundries and keeping dust to a minimum.

Wheelabrator Plant

The stripped mould is then taken to a Wheelabrator shot-blast plant (Fig. 17). The Wheelabrator is a two-door chamber model, through which are rails to take the bogies carrying the mould. The floor of the chamber comprises a turntable, and the rails are cut to allow the bogie to revolve. The bogies are pulled into the chamber by a winch and the arrangement is such that one bogie enters whilst another is leaving. The moulds are cleaned by the discharge of chilled-iron shot from three motor-driven multi-vane impellors—one in the roof and two at different heights on one of the side walls. Shot is mechanically fed into the centre of the impellors, which revolve at high speed, and the abrasive is thrown out with such a high force that it cuts away all sand until it reaches the metal, which it polishes. The impellor in the roof cleans out the core sand and the two on the wall deal with the outside sand. During the operation, the bogie revolves slowly so that all parts can be cleaned, the sand and shot falling through the perforated flooring to a hopper beneath, and then by means of belt and elevator to a separator on top of the chamber. The separated shot is subsequently returned to the impellors and the sand to the waste-sand conveyor belt. The use of two bogies allow for unloading and loading being carried on during the cleaning operation.

From the Wheelabrator, the mould casting goes to the dressers (Fig. 18), where all heads, fins, etc., are dressed off with pneumatic chippers or grinders and the mould is prepared ready for despatch. The dressing area is particularly free from sand and dust usually associated with ingot-mould fettling. Three rail tracks feed the despatch department (Fig. 19) at right angles to the main bay, and this allows nine wagons to be berthed at one shunting operation.

Laboratories and Records Department

There are well-equipped laboratories for sand analysis, for checking moisture, green- and dry-strength of the sand, and for the analysis of incoming wagons of pig-iron so as to ensure as little deviation as possible from standards. Every mould cast is numbered, card records being kept showing the make-up of the charge, the tapping and casting temperatures, time taken for pouring, analysis of metal from ladle, composition of the test-piece taken from the casting, and the time taken for dressing. These cards are made out in duplicate, one being retained at Landore and the other being sent to the steelworks where the moulds are used. When a mould has completed its life, records are made and entered on the card so that there is a complete history of each mould.

Before concluding, the Author would like to emphasize that the foundry was designed at the West Wales Development Section, Gowerton, Mr. Dimmock, the group engineer, being in charge. The knowledge, experience and thoughts of the staff of the old ingot-mould foundry were pooled and from this knowledge the design gradually emerged. Mr. Gwilym Rees, works manager, was consulted as the work proceeded step-by-step. The main controlling factors were:—(1) To build a foundry capable of producing 1,000 to 1,200 tons of ingot moulds weekly; (2) to design a foundry in which hard physical work was reduced to a minimum; and (3) to implement the "Garrett Report" by building a foundry that was light and airy, and which would be kept clean and free from dust, giving working conditions as near perfect as possible.

Imports and Exports of Iron and Steel in June

The following tables, based on Board of Trade returns, give figures of imports and exports of iron and steel in June. Figures for the same month in 1951 are given for the purposes of comparison and totals for the first five months of 1952 and of 1951 are also included.

Exports of Iron and Steel (tons)

Destination.	Month ended June 30.		Six months ended June 30.	
	1951.	1952.	1951.	1952.
Channel Islands	885	550	4,528	3,709
Gibraltar	92	452	363	1,039
Malta and Gozo	596	218	1,644	1,269
Cyprus	359	734	2,652	2,963
Sierra Leone	1,286	572	2,581	2,777
Gold Coast	1,246	2,514	9,601	16,199
Nigeria	5,438	4,100	31,220	22,748
Union of South Africa	9,990	11,162	70,022	74,255
Northern Rhodesia	1,064	2,431	8,100	15,389
Southern Rhodesia	4,563	5,873	19,252	26,460
Tanganyika	1,750	2,113	9,609	11,518
Kenya	5,788	2,550	30,966	22,871
Uganda	606	457	2,754	3,702
Mauritius	538	580	3,742	3,048
Bahrein, Qatar, and Trucial Oman	227	1,039	3,861	8,635
Kuwait		1,454		9,078
India	6,273	6,887	49,186	37,790
Pakistan	5,479	4,803	43,942	37,780
Malaya	6,380	5,052	38,030	39,843
Ceylon	2,735	1,711	16,054	11,991
North Borneo	737	244	2,602	1,668
Hongkong	4,321	1,302	35,680	10,076
Australia	20,364	22,392	176,950	166,410
New Zealand	3,150	11,496	56,467	72,033
Canada	21,125	13,113	122,524	93,557
Jamaica	1,888	749	8,716	13,787
Trinidad	2,039	3,373	17,529	25,340
British Guiana	411	1,028	3,240	3,306
Anglo-Egyptian Sudan	787	2,042	5,056	9,742
Other Commonwealth	1,854	2,746	12,257	16,066
Irish Republic	5,937	5,957	47,569	33,913
Soviet Union	—	549	2,230	586
Finland	1,744	2,612	17,987	31,651
Sweden	9,425	7,891	52,433	60,037
Norway	6,315	4,053	35,666	31,788
Iceland	200	126	1,438	1,594
Denmark	5,298	5,200	44,767	45,550
Poland	34	5	543	86
Germany	122	162	625	767
Netherlands	8,292	8,524	45,724	49,689
Belgium	765	573	6,738	4,155
France	123	169	3,765	1,262
Switzerland	830	730	6,584	4,754
Portugal	834	473	8,126	4,605
Spain	244	1,431	2,132	4,639
Italy	3,908	367	18,161	6,839
Austria	31	27	276	319
Yugoslavia	9	316	5,009	2,762
Greece	197	247	1,570	1,961
Turkey	315	642	2,380	4,369
Netherlands Antilles	26	1,030	1,554	6,843
Belgian Congo	200	165	1,242	1,610
Angola	143	76	1,459	2,222
Portuguese E. Africa	254	413	2,022	2,625
Canary Islands	641	35	1,320	457
Syria	1,609	445	2,168	1,455
Lebanon	2,216	201	8,455	7,549
Israel	4,551	1,060	16,036	8,781
Egypt	2,502	2,965	19,624	17,518
Morocco	12	12	1,292	137
Saudi Arabia	64	709	236	3,406
Iraq	716	5,537	11,806	27,268
Iran	8,897	1,380	49,298	5,939
Burma	1,566	959	7,644	6,828
Thailand	1,905	946	8,939	4,782
Indonesia	1,081	1,224	3,823	8,314
China	164	—	4,597	8
Philippine Republic	274	16	1,919	2,174
U.S.A.	12,817	2,437	99,630	25,003
Cuba	270	220	2,521	1,253
Colombia	282	329	3,432	2,750
Venezuela	1,296	2,469	15,438	21,946
Ecuador	204	235	701	2,199
Peru	1,699	553	6,316	4,797
Chile	160	80	5,137	2,047
Brazil	1,431	1,736	11,893	13,453
Uruguay	577	171	7,614	3,068
Argentina	3,232	2,045	24,818	20,082
Other foreign	1,180	1,086	9,504	10,560
TOTAL	206,556	182,325	1,423,289	1,271,449

Total Imports of Iron and Steel (tons)

From	Month ended June 30.		Six months ended June 30.	
	1951.	1952.	1951.	1952.
India	1	2	2	228
Canada	3,495	16,366	22,764	54,179
Other Commonwealth countries and the Irish Republic	163	195	788	2,309
Sweden	2,090	2,018	11,095	13,815
Norway	3,414	9,256	24,541	36,676
Germany	2,025	7,977	8,707	47,948
Netherlands	5,228	9,584	33,321	67,416
Belgium	19,516	27,871	75,177	152,892
Luxemburg	7,158	16,599	41,863	81,515
France	25,843	19,934	123,032	122,427
Austria	1,118	24,873	9,078	73,146
U.S.A.	2,650	87,684	17,955	333,896
Other foreign countries	694	27,019	1,418	90,183
TOTAL	73,395	249,378	369,741	1,076,630
Iron and steel scrap and waste, fit only for the recovery of metal	42,002	71,947	318,789	280,375

Total Exports of Iron and Steel (tons)

Product.	Month ended June 30.		Six months ended June 30.	
	1951.	1952.	1951.	1952.
Pig-iron	1,121	419	13,265	2,052
Ferro-tungsten	30	11	284	87
Other ferro-alloys	78	206	1,175	1,910
Ingots, blooms, billets, and slabs	202	6	4,513	90
Iron bars and rods	993	299	5,623	1,949
Sheet and tinplate bars and wire rods	1,654	57	7,702	686
Bright steel bars	2,113	1,251	20,858	6,598
Alloy steel bars and rods	1,042	1,312	7,798	7,834
Other steel bars and rods	11,080	8,985	111,657	57,621
Angles, shapes, and sections	11,252	10,538	93,444	69,522
Castings and forgings	872	767	5,441	6,494
Girders, beams, joists, and pillars (rolled)	3,030	1,881	20,746	18,429
Hoop and strip	4,058	3,212	34,485	25,592
Iron plates and sheets	34	6	1,036	229
Tinplate	18,688	21,867	123,149	151,161
Tinned sheets	200	228	1,559	843
Terneplates and decorated tinplates	46	61	621	452
Other steel plate (⅛ in. thick and over)	20,069	14,491	150,500	120,091
Galvanized sheets	2,508	5,239	29,063	32,810
Black sheets	13,973	8,686	78,894	69,136
Other coated plates and sheets	748	924	5,070	5,433
Cast-iron pipes up to 6 in. dia.	5,069	6,960	37,418	45,419
Do. over 6 in. dia.	4,783	5,800	34,690	33,154
Wrought-iron tubes	32,567	32,191	201,941	217,876
Railway material	22,175	15,521	125,181	101,645
Wire	3,940	3,463	32,121	26,995
Cable and rope	2,208	2,146	15,371	15,408
Wire nails, etc.	2,211	734	14,941	5,715
Other nails, tacks, etc.	234	349	2,126	2,556
Rivets and washers	913	498	3,718	3,222
Wood screws	233	286	1,868	2,148
Bolts, nuts, and metal screws	2,270	150	13,829	1,287
Baths	1,073	666	6,895	8,825
Anchors, etc.	682	743	4,514	5,299
Chains, etc.	1,046	642	5,442	5,271
Springs	472	463	3,259	3,165
Holloware	1,988	2,524	16,200	18,310
Doors and windows	2,176	1,960	10,831	11,057
TOTAL, including other manufactures not listed above	206,556	182,325	1,423,289	1,271,449

British and American Iron and Steel Industries Compared

The Report of the Productivity Team from the British iron and steel industry, published recently, is welcomed because of the light it throws on the many problems confronting the industry. The recommendations given come at a time when the new five-year plan is being finalized by the British Iron and Steel Federation. This has, as its basis, the future production of 20 million ingot tons of steel and 15 million tons of pig-iron per year.*

A comparison of conditions in the iron and steel industry in Great Britain with its American counterpart would normally be more enlightening to the general public than to those actually engaged in the industry in this country, because conditions in the United States always have been the subject of close study. However, a strong team led by Sir Charles Goodeve, director of the British Iron and Steel Research Association, and Mr. S. Thomson, a director of Colvilles, Limited, deputy leader, spent several weeks there in 1951 under the auspices of the Anglo-American Council on Productivity, and it is fitting that the principal conclusions and recommendations of their useful report should receive careful consideration throughout the foundry and steel industries. The members of the team were chosen by a joint committee consisting of Sir Ellis Hunter, Mr. G. H. Latham and Mr. N. H. Rollason, respectively president, past-president and president-elect of the British Iron and Steel Federation, together with Mr. Lincoln Evans, general secretary of the Iron and Steel Trades Confederation, and Mr. J. Owen, general secretary of the National Union of Blastfurnacemen, Ore Miners, Coke Workers and Kindred Trades.

The team's terms of reference were:—(1) To study and report on the organization and methods of the United States iron and steel industry in the production of pig-iron for steelmaking, open-hearth steel and heavy rolled products (heavy bars and sections, rails, plates and billets); (2) to consider those factors relevant to the comparative productivity of the U.S. and U.K. industries in the above sections, and to draw conclusions accordingly; and (3) to recommend how far and by what methods the principles and experience of the U.S. industry can, with benefit, be applied or adapted in the U.K.

Conclusions and Recommendations

Many of the factors considered in the report are well known to the industry, as are also the problems to be overcome before the action necessary to make improvements can be taken. Many big handicaps, however, will always remain. Britain will have to rely to a great extent on home ores which are inferior in quality to American ores. She will for some time at least be left in doubt as to whether her plentiful coking coal can be got out of the ground fast enough to meet the growing needs of her furnaces. She has a heavy investment in a large number of steelworks, each of which contains some valuable equipment not to be scrapped without hesitation; yet the layout and balance of these works limits the size and character of new units. Above all, at least at present, her capital re-equipment has to be achieved within the limited resources which can be allowed in the face of claims from other industries and public services, and in competition with the needs for export, rearmament and civilian consumption.

Blast-furnace Size

In all sections of the British iron and steel industry the greatest limitation upon productivity today is the size of the unit of plant. Modern blast-furnaces of types now being built in Britain have a capacity, so far as size is concerned, two to three times greater than the present national average. It is recommended that a minimum hearth diameter of 25 ft. for imported ore and 27 ft. for home ore for furnaces on basic iron should be accepted as a normal standard in new developments. Those works unable at present to take the whole of the output of such furnaces should make a proportion of cold pig-iron or modify the furnace to operate temporarily at a lower rate.

Largely because of the relation between the size of the unit of plant and the size of the works, the efficiency of any integrated steelworks making bulk steel (*i.e.*, excluding alloy and special steels, forgings and castings) increases steadily as it grows to a capacity of between three-quarters and one million ingot tons per year. Above this the gain is small. Works which use the cold-metal practice will, of course, be of a smaller optimum size. The average capacity of the 40 British steelworks making bulk steel in 1950 was about 325,000 tons per year. The industry is planning to increase its output of steel to meet a demand estimated at near 20 million tons, of which over 90 per cent. will be bulk steel. It follows that if all these steelworks are expanded or even retained it will not be possible to reach anything like the minimum size for efficient operation. Therefore it will be necessary for development and re-equipment to be concentrated in the works most suitably sited for expansion.

Transport and Raw Materials

Cheap transport is essential to the concentration and flexibility of the iron and steel industry. For instance, iron production from low-grade home ore is greatly improved when this is blended with

* The report, "Iron and Steel," is published by the Anglo-American Council on Productivity, 21, Tothill Street, London, S.W.1. (Price 5s., post-free.)

high-grade imported ore, and a reduction in the cost of transport would make economically feasible the use of a proportion of foreign ore in almost every blast-furnace in this country. Also, home ores could be used more economically over a wider area. In fact, cheap transport of raw materials and products would materially affect the whole economics of steelworks location and size. It would also improve competition between works and specialization in products.

The most serious long-term question in Britain is that of fuel, particularly coking coal. The U.S. has the enormous advantages of cheap high-grade coke, oil and natural gas. Britain has ample reserves of coking coal in the ground, but it is more difficult to mine than American coal and the demand exceeds the supply. The building of new oil-refineries in Britain will, however, increase the quantity of fuel-oil available for industrial use.

Blast-furnaces are highly efficient plants from a fuel standpoint, and British furnaces are operated nearer the minimum coke consumption rate than are American ones. The report states that there is still room for improvement in the size distribution and bulk density of British coke by better coking technique and more elaborate screening and handling methods.

Firebrick refractories in America are considerably better, and silica bricks perhaps slightly better, than in Britain; basic bricks are of similar quality in both countries. The larger size of open-hearth furnace gives advantages in refractory consumption rates.

Design of Units and Operating Rates

Except as to size, the design of modern British blast-furnaces, open-hearth furnaces and other equipment is generally at least equal to that of modern American equipment. In some respects it is better as, for example, in the design of carbon hearths for blast-furnaces, in sintering practice, in the application of aerodynamic principles to open-hearth furnace design, and in instrumentation and control. Nevertheless, there are many points of detail to be found in America which deserve, and generally are already receiving, consideration in Britain. Notable among these are pelletizing of ore fines, high top-pressure on blast-furnaces, twin oil burners in steel furnaces, and three-high mills, multiple drives and improved guide arrangements on rolling mills, and open-hearth furnaces designed to facilitate rapid repair.

The output per unit of plant is on the average 1.5 to 2.8 times as great in the U.S. as in Britain. Nevertheless, American manning per unit of plant is generally lower. The question immediately arises: how does each American workman manage to handle two or three times as much steel? The general answer is two-fold, in that he has to push his control levers, tap his furnaces and perform the many other operations in his daily duties rather more frequently, and that every time he pushes a lever or taps a furnace a larger amount of steel is moved. These factors together account for most of his higher productivity.

Statistically, this is by far the most complete report emanating from any team connected with the metallurgical industries after a visit to the United States. It is interesting to learn that while in America only 10 per cent. of the blast-furnace pig-iron is consumed by the foundry industry, in this country the percentage is of the order of 20. It is announced that the British iron and steel industry is to step up production to 20 millions a year. As the ratio of steel-ingot output to ingot-mould production is well known, it is obvious that the quantity of the latter will have to be increased. Moreover, as hematite iron is necessary for their manufacture, it is to be hoped that in the proposed production of 15 million tons of pig-iron there will be included in this output adequate quantities of low sulphur and phosphorus material. As in general, the ironfoundry industry output is in a more-or-less fixed ratio to the steel production, then if that programme be achieved, the iron foundries will have to be extended to give a yield of 5 million tons yearly.

Management and Labour

The British iron and steel industry has benefited enormously from a long period of good relations between management and trade unions, especially those unions more exclusively concerned with the industry. By means of good leadership on both sides, methods of negotiation have grown up in the industry which assist the solution of those problems that may arise from time to time. The American steel industry has within the last ten or fifteen years emerged from a period of severe strife. At the time of the team's visit industrial relations seemed good at local level, although less stable than those in Britain. Thanks partly to the good salaries paid to full-time union executives, a good type of individual has been attracted to the American union organization.

Development Plans and Future

The British iron and steel industry is now proceeding with the construction programme set out in its first development plan, begun in 1945, and is formulating its second development plan. In carrying out the first plan, an early increase in the total output of steel was of paramount importance, and it has not always been possible to reconcile this with the need to attain the maximum productivity. The committee charged with the task of preparing the second plan has, however, been asked by the British Iron and Steel Federation to place emphasis on reducing costs and improving quality as well as to provide for a major expansion. Increased productivity must be part of any long-term policy of reducing costs, and it is therefore recommended that the committee should give this aspect a prominent place in its considerations, using where applicable the lessons that can be learned from America. A great deal, however, can be learned within the British industry itself, by comparisons both between works and between different conditions in any one works.

Personal

MR. R. H. HOUSTON, managing director of the Thermal Syndicate Company, Limited, Wallsend-on-Tyne, has retired after 25 years with the company.

MR. KENNETH S. BROWN, formerly of the Constructional Engineering Company, Limited, Birmingham, has now joined the British Moulding Machine Company, Limited.

THE Research and Development Division of the British Steel Founders' Association announces that MR. T. A. COSH, B.Sc., A.R.T.C., A.I.M., has joined the Division's metallurgical research staff.

AFTER 48 years' service with the Workington Iron & Steel Company (branch of the United Steel Companies, Limited), MR. W. COWEN, analytical chemist at the firm's central laboratory, has retired.

MR. JOHN M. CALDWELL, J.P., general manager of Scottish Oils, Limited, has been appointed a director of the company as from July 17, thus following in the footsteps of his father and grandfather.

MR. T. A. CROWE, chief managing director of North British Locomotive Company, Limited, Glasgow, has been appointed chairman of Henry Pels & Company, Limited, press and tool manufacturers, etc., of London, N.W.1.

FORMERLY commercial manager of the Whitehead Iron & Steel Company, Limited, Newport (Mon.), MR. T. G. RODGER has been appointed general manager of H. L. Reynolds, Limited, structural and sheet metal engineers, of Leeds.

MR. A. ROBERT JENKINS, J.P., A.I.Mech.E., deputy managing director of Robert Jenkins & Company, Limited, of Rotherham, was installed as president of the Institute of Welding for 1952-53 at the annual general meeting on July 22.

SIR ANDREW MCCANCE, D.Sc., chairman of the Mechanical Engineering Research Board and deputy-chairman and joint managing director of Colvilles, Limited, has been appointed a member of the East Kilbride Development Corporation.

SIR BERNARD DOCKER has been appointed managing director of the Birmingham Small Arms Company, Limited. In addition to being chairman of B.S.A., he has also been acting substantially in the capacity of managing director for a number of years.

MR. G. F. BROCKETT, of Coupar, Angus, has been appointed president of the Scottish Agricultural Machinery Association, with Mr. Charles Kemp, of Glasgow, as vice-president, and Mr. J. R. L. Cruickshank, of 22, Rutland Street, Edinburgh, as secretary and treasurer.

THE UNIVERSITY OF WALES has conferred the honorary degree of Doctor of Science on MR. IVOR RICHARD COX, managing director of Metropolitan-Vickers Electrical Company, Limited, Trafford Park, Manchester, in recognition of his outstanding services to the electrical industry

MR. ALBERT FLINT, former office manager of Brown Bayley's Steel Works, Limited, Sheffield, attended Buckingham Palace recently to receive the M.B.E. from the Queen, an honour awarded for his services to the steel industry. He worked with the late Mr. Harry Brearley, the discoverer of stainless steel.

MR. ERIC SHAW, sales director of the Oughtibridge Silica Firebrick Company, Limited, and director of Monolithic Dolomite Limited, Steetley, has been elected a member of the Council of the Refractories Association of Great Britain. He is a member of the Iron and Steel Institute and was a member of the basic-furnace linings committee of that body.

THE FOLLOWING APPOINTMENTS have been announced by the Workington Iron & Steel Company (branch of the United Steel Companies, Limited):—MR. J. D. YOUNG becomes manager of the Bessemer department; MR. J. M. MCCUTCHEON becomes manager, arc-furnace department, MR. R. THORNBURROW succeeds MR. T. WILLIAMS as manager of the traffic department; MR. J. REID becomes assistant traffic manager; MR. J. BANKS succeeds MR. A. BROADBENT (retired) as assistant manager, rail-bank department.

AT THE annual general meeting of the British Standards Institution, it was announced that the General Council had elected Mr. John Ryan, C.B.E., M.C., as its chairman to succeed Sir Roger Duncalfe, who had completed his three years' term of office. In the course of the meeting, the Rt. Hon. Viscount Waverley, P.C., G.C.B., G.C.S.I., G.C.I.E., F.R.S., was re-elected president of the Institution for the third year. Sir Roger Duncalfe was elected vice-president. The new chairman, Mr. John Ryan, is vice-chairman of the Metal Box Company, Limited.

THE RETIREMENT took place on July 25 of Mr. Harry Woodhead, chairman of Jowett Cars, Limited, Bradford, and on July 23 in the works canteen at Idle he was presented with a farewell gift—a refrigerator—by Mr. A. F. Jopling, managing director, on behalf of the co-directors, staff and workpeople at Clayton, Idle and London, as well as the firm's overseas representatives. Mr. Woodhead gave up school-teaching 33 years ago to devote himself to motor-cars. During his retirement, Mr. Woodhead will be by no means inactive, for he is a Bradford City magistrate, vice-chairman of Bradford Northern Rugby League Football Club, and also serves on various committees connected wwith labour and housing. In 1948 he was awarded the O.B.E.

Obituary

MR. ALEXANDER STEWART, a director of Wm. Macleod & Company (Metals), Limited, Glasgow, died recently.

THE DEATH has occurred of MR. NORMAN D. NEWALL, a director of Birfield Industries, Limited, Laycock Engineering Company, Limited, and other concerns. He was 63. Mr. Newall was High Sheriff of Northumberland in 1940.

MR. CHARLES FRANKLIN PEARSON, founder of the Birmingham brassfoundry firm, Pearson, Page and Jewsbury Company, Limited, died at Bromyard on July 21, at the age of 83. A Birmingham man by birth, Mr. Pearson early entered the brassfoundry trade and started his own business towards the end of the last century.

Hot-dip Galvanizing of Cast Iron

We regret that, owing to a printer's error, Mr. Nutt's contribution to the discussion on "Hot-dip Galvanizing" (page 108, JOURNAL, July 24) had its sense inverted. The relevant paragraph should have commenced:—

"MR. R. E. NUTT (Court Works, Limited) commented on the Author's statement that certain embrittling effects were in evidence in malleable-iron castings after galvanizing. He suggested that this was *not* the case in whiteheart malleable iron having a silicon content of 0.5 per cent. with phosphorus 0.05 per cent."

News in Brief

A BRITISH STANDARD (B.S. 1867: 1952) for solid-drawn aluminium-bronze tubes for general purposes (7 per cent. aluminium) has been issued.

EMPLOYEES of Beech Hill & Company, Limited, Greets Green Foundry, West Bromwich, this year visited Windsor for their annual outing.

AN ORDER has been received by Wm. Simons & Company, Limited, Renfrew, for a single-screw salvage vessel for the Port of London Authority.

A LIGHT ENGINEERING FACTORY is to be built at Adlington (Lancs) by Stockdale Engineering, Limited. The new premises will cover an area of 12,000 sq. ft.

THE SEVENTH National Instrument Conference and Exhibit will be held in the Public Auditorium, Cleveland, Ohio, from September 8 to 12.

EVERY SECTION of British industry is being urged to make a major effort at the Coronation Year British Industries Fair which will be held in London and Birmingham from April 27 to May 8.

FORGE AND BLOWER COMPANY, Naroda Road, Ahmedabad, India, who claim to operate one of the largest foundries in Gujarat, wish to receive literature from British manufacturers of foundry plant and equipment.

THE FULL REPORT of the Conference on Heating, Lighting and Ventilating for Iron Foundries is now available for non-members at 18s. net (members 15s. net) on application to the British Cast Iron Research Association, Alvechurch, Birmingham.

AN ORDER for a tanker of 16,500 tons dw. has been placed with the Glasgow firm of Wm. Hamilton & Company, Limited, by Mr. H. E. Hansen-Tangen, of Kristiansund. The contract, which is valued at about £800,000, provides for the delivery of the vessel in 1956.

EXTENSIONS to the premises of the Quasi-Arc Company, Limited, Bilston (Staffs), have increased the area available for electrode production by 40 per cent. A new storage block for electrodes and welding plant and a loading bay have been added to the main factory building.

AMERICAN METAL EXPORTS, INC., New York, has anonunced its intention of investing about £2,000,000 in the development of Malayan iron-ore deposits at Tewangang, in Kelantan, which the company acquired from Chinese interests last year. It is intended to ship the ore to Japan.

THE BUSINESS of Kerr, Newton & Calder, metal merchants, engineers' agents, etc., of 163, Hope Street, Glasgow, has been dissolved, due to the retirement of Mr. James C. M. Kerr. The business is being continued by Mr. Robert Calder on his own account, and under the existing business name.

WORK HAS ALREADY BEGUN on the construction of a large-scale extension to the engine works of Wm. Doxford & Sons, Limited, Sunderland. Additional employment for between 500 and 600 men will be provided by the extension, and it is expected that production will be stepped up by about 50 per cent.

BIRMINGHAM CITY COUNCIL has been presented by an anonymous donor with a wine-cooler in Sheffield plate, *circa* 1820, made at the Soho Foundry, and bearing Matthew Boulton's mark of "two suns," which continued to be used by the firm after his death. It is a notable addition to the city's civic plate.

IN THE WEEK ENDING June 28 at the South Bank wharf on the River Tees of Dorman, Long & Company, Limited, five large ore ships were completely discharged, and two more partly discharged. The total quantity of ore handled over the wharf in that week was 41,838 tons, all of which was handled in 12¼ working shifts. On July 3 one vessel discharged 3,778 tons of iron ore in less than 12 working hours.

THE NORTH BRITISH LOCOMOTIVE COMPANY, LIMITED have announced that they have purchased the whole of the issued share capital of Carntyne Steel Castings Company, Limited, of Renfrew. It is not their intention to make any change in the policy of the previous management whereby castings are supplied to any other companies who are interested in their products. The directors appointed to manage the affairs of the company are Mr. J. B. Mavor (chairman), Mr. T. A. Crowe, Mr. R. Arbuthnott and Mr. J. Gibb (general manager).

THE HUNSLET ENGINE COMPANY, LIMITED, has received from the National Coal Board an order for 37 six-coupled steam tank-locomotives of 48½ tons weight, of the so-called "austerity" type, which, with another 12 already in hand, are likely to cover all the Board's requirements for the heaviest class of pit-head shunting power over the next five years. The value of the new order is about £350,000 and is believed to be the largest single order for industrial locomotives ever placed in Great Britain under peace-time conditions.

SIR WALTER MONCKTON, Minister of Labour, is to be the principal speaker at the annual conference of the Institution of Works Managers which is to be held in Birmingham (for the first time) in October. The theme of the conference is to be "Objectives of Management—bearing in mind the need for greater productivity." Other speakers will be Mr. A. B. Waring, of Joseph Lucas, Limited; Mr. W. R. P. King, of the Birmingham Mint; Professor Sargant Florence and Professor T. U. Matthew, of Birmingham University, and Sir Raymond Priestley. The conference will take place in the Town Hall, Birmingham.

AT THE ANNUAL EXHIBITION of the Association of Iron and Steel Engineers in Cleveland, Ohio, U.S.A., in September, the scale model of the new steel plant of the Consett Iron Company, Limited, Consett (Co. Durham), will be the joint and sole exhibit of Davy & United Engineering Company, Limited, Sheffield, and the Morgan Construction Company, of Massachusetts. These firms designed the blooming and slabbing mill and continuous billet and slab mill built by Davy & United Engineering Company at a cost of about £2,000,000. The model, which was shown at the Festival of Britain, has 4,000 components and is powered by a fractional horse-power motor. It was made in six months by Mills Bros. (Model Engineers), Limited, of Sheffield.

MR. LESLIE GAMAGE, vice-chairman and joint managing director of the General Electric Company, Limited, and president of the Institute of Export, told members of the Institute's Birmingham branch on July 23 that the Empire market offered better long-term prospects for British manufacturers than did America. "To sell manufactured goods to the United States is like making water flow uphill," he said, "it can be done by vast effort—it must be done today—but it is not the natural order of things. The Empire is our natural market." "Are we to continue for ever working on the dollar treadmill?" asked Mr. Gamage, continuing, "I urge that we should cease dithering, sign our own declaration of independence, and go all out for Empire development."

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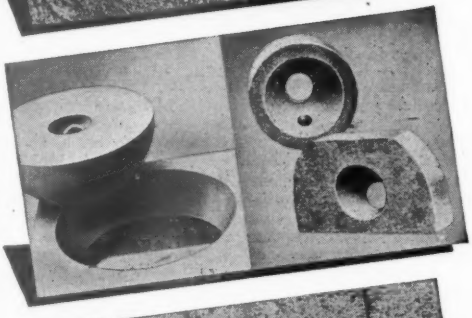

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Raw Material Markets

Iron and Steel

Many foundries are now closed down for holidays, during which time stocktaking is being carried out, while structural alterations are also in hand in some instances. Some foundries have thus found it necessary to suspend arrivals of raw materials during the holidays; others, however, have arranged for staff to be available to receive deliveries of pig-iron, scrap, and coke so as to ensure that supplies will be available for the resumption of work.

The holiday period will enable major repairs and overhauls to be carried out, in addition to the relining of cupolas, thus avoiding interruptions when plants are ready to resume.

Holidays apart, there is no falling off in the demands of the engineering and speciality foundries for the low- and medium-phosphorus grades, hematite, and refined irons, and the light and jobbing foundries are able to utilize all the high-phosphorus iron which producers can allocate. Available tonnages of scrap fall far short of requirements, particularly heavy machinery cast-iron scrap and ordinary heavy cast-iron scrap, and only those foundries using the lighter grades are well situated. Foundry coke supplies are sufficient for current consumption.

Pig-iron outputs are maintained by the furnaces in blast, and production figures should show an appreciable increase with the blowing-in recently of five new furnaces. The increased supplies of basic-steel making pig-iron will stimulate production at the steelworks. They are still very short of scrap; while the scrap drive has provided good results, this is not a solution to the problem caused by the small deliveries from abroad. The recently improved deliveries of ore are maintained, and supplies of blast-furnace coke have increased.

With the increased production of basic pig-iron, the foundries should benefit ultimately in supplies, particularly of hematite, large tonnages of which have been sent to the steelworks, and a continuity of supplies from the furnaces now producing the foundry grades should be more assured.

The re-rolling mills are also faced with holidays. Deliveries of steel will be welcomed during that period, as the accumulation of some stock would indeed be an accomplishment for this section of the industry. They are still very short of semi-manufactured steel and, although better deliveries have been received from the Continent, these are insufficient to enable the mills to work to capacity in view of the meagre quantities coming to hand from home steelworks. The continuation of the American steel strike is reducing the prospect of obtaining early deliveries of more steel from that country.

There is a good demand for small sections, bars, strip, and sheets. Many orders are on hand for colonial markets and against bilateral agreements and the needs of home consumers are heavy. Some of the re-rollers cannot take up their full allocated tonnages for export owing to the continued closure of some oversea markets, and are further handicapped by the fact that our prices for small bars and sections are not competitive with Continental makers. This also applies to light rails. They have, however, more work on hand than the supply of steel will permit them to produce.

The sheet re-rollers are also well supplied with work, but, in common with the other mills, are tied down in their production to the amount of sheet bars and slabs presently coming to hand; these fall far short of requirements.

Non-ferrous Metals

It is hoped that it will be possible to give effect to the Government's decision to restore private trading in lead on October 1. Lord Swinton, Chancellor of the Duchy of Lancaster and Minister of Materials, stated in the House of Lords on Monday that private trading would be permitted as soon as the necessary arrangements could be made. The Minister said that from the date of reversion the private import of virgin lead would be permitted and the London Metal Exchange would reopen for transactions in lead. The Ministry of Materials would cease to trade in lead except to the extent necessary to wind up its trading operations.

In reaching this decision, Lord Swinton said that the Government had taken account of the improvement in lead supplies, the importance for the export trade of enabling the United Kingdom consumers to buy at fully competitive prices, and the advantages to the balance of payments and the position of sterling from the earnings which would arise directly and indirectly from reopening an international lead market in London.

It is quite evident from the statistics issued by the Copper Institute in New York that the United States must continue to import foreign copper, for home consumption of the metal exceeded domestic production by nearly 20,000 tons in June, and on occasions the disparity is more. United States output of crude copper, primary and secondary, in June was 79,588 short tons, with production of refined at 92,151 tons. Deliveries of refined copper to American fabricators totalled 98,416 tons, while stocks of this grade in producers' hands at the end of June were 70,856 tons. Outside the United States crude copper production was 129,502 tons and output of refined 114,509 tons. Deliveries to consumers amounted to 88,738 tons, while stocks of refined copper were 192,629 tons. Here there was an increase of about 16,000 tons over the tonnage at May 31. Of the other figures mentioned above, U.S. refined stocks were up by 15,000 tons. There was a drop of about 14,000 tons in U.S. output of crude copper and of more than 5,000 tons in the production of refined. The total of deliveries to American fabricators in June was about 7,000 tons lower than in July.

Business is quiet at the moment, many factories being now closed for annual holidays. Consumers have been buying their copper on a hand-to-mouth basis, for at the present price level they are not inclined to look far ahead. Some interest has developed in zinc; it has been presumed that settlement of the American steel strike will lead to an improved demand in the States and possibly to an increase in the price of the commodity.

Users of scrap have kept up their interest and parcels of good grade copper have been taken up readily. In brass, too, interest has been maintained, sales of ingots for remelting being made well below the permitted maximum of £228. Nothing further has been heard of a possible termination of control of scrap prices.

London Metal Exchange official tin prices were:—

Cash—Thursday, £969 to £970; Friday, £970 to £970 10s.; Monday, £967 to £968; Tuesday, £967 15s. to £968; Wednesday, £965 10s. to £966.

Three Months—Thursday, £966 to £967; Friday, £968 to £968 10s.; Monday, £966 to £966 10s.; Tuesday, £966 to £966 5s.; Wednesday, £964 10s. to £965.

MR. W. O. ADAMS, past-president, and Mr. W. L. Moulding, vice-president of the Institute of Australian Foundrymen gave a lecture last month to the Victorian division on "Overseas Impressions."

THE PARTNERSHIP formerly carried on by Mr. L. N. Wilson and Mr. N. G. Calder as Chirnside & Company has now been converted into a Limited Company, known as Wilson, Chirnside & Company, Limited.

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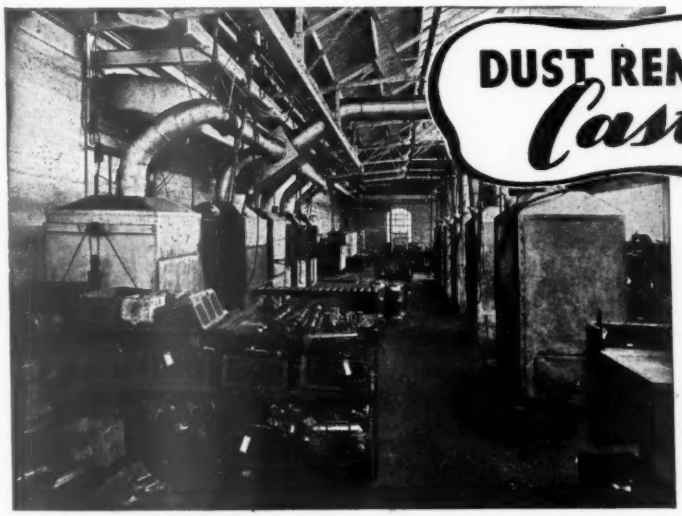

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Current Prices of Iron, Steel, and Non-ferrous Metals

(Delivered, unless otherwise stated)

July 30, 1952

PIG-IRON

Foundry Iron.—No. 3 IRON, CLASS 2:—Middlesbrough, £13 1s. 6d.; Birmingham, £12 15s. 3d.

Low-phosphorus Iron.—Over 0.10 to 0.75 per cent. P, £13 17s. 6d., delivered Birmingham. Staffordshire blast-furnace low-phosphorus foundry iron (0.10 to 0.50 per cent P, up to 3 per cent. S), d/d within 60 miles of Stafford, £15 5s. 9d.

Scotch Iron.—No. 3 foundry, £14 4s. 6d., d/d Grangemouth.

Cylinder and Refined Irons.—North Zone, £17 4s. 6d.; South Zone, £17 7s.

Refined Malleable.—P, 0.10 per cent. max.—North Zone £17 14s. 6d.; South Zone, £17 17s.

Cold Blast.—South Staffs, £18 7s.

Hematite.—Si up to 2¼ per cent., S. & P. over 0.03 to 0.05 per cent.:—N.-E. Coast and N.-W. Coast of England, £13 11s. 6d.; Scotland (Scotch iron), £13 18s.; Sheffield, £14 9s. 6d.; Birmingham, £14 17s. 6d.; Wales (Welsh iron), £13 18s.

Basic Pig-iron.—£12 10s. all districts.

FERRO-ALLOYS

(Per ton unless otherwise stated, delivered.)

Ferro-silicon (6-ton lots).—40/55 per cent., £57 10s., basis 45% Si, scale 21s. 6d. per unit; 70/84 per cent., £86, basis 75% Si, scale 23s. per unit.

Ferro-vanadium.—50/60 per cent., 22s. per lb. of V.

Ferro-molybdenum.—65/75 per cent., carbon-free, 10s. per lb. of Mo.

Ferro-titanium.—20/25 per cent., carbon-free, £204; ditto, copper-free, £212.

Ferro-tungsten.—80/85 per cent., 28s. 7d. per lb. of W.

Tungsten Metal Powder.—98/99 per cent., 31s. 7d. per lb. of W.

Ferro-chrome (6-ton lots).—4/6 per cent. C, £85 4s., basis 60% Cr, scale 28s. 3d. per unit; 6/8 per cent. C, £80 17s., basis 60% Cr, scale 26s. 9d. per unit; max. 2 per cent. C, 2s. per lb. Cr; max. 1 per cent. C, 2s. 2½d. per lb. Cr; max. 0.15 per cent. C, 2s. 3½d. per lb. Cr; max. 0.10 per cent. C, 2s. 3¾d. per lb. Cr.: max. 0.06 per cent. C, 2s. 4d. per lb. Cr.

Cobalt.—98/99 per cent., 20s. per lb.

Metallic Chromium.—98/99 per cent., 6s. 5d. to 6s. 9d. per lb.

Ferro-manganese (blast-furnace). — 78 per cent., £43 15s. 2d.

Metallic Manganese.—93/95 per cent., carbon-free, £262 per ton.

SEMI-FINISHED STEEL

Re-rolling Billets, Blooms, and Slabs.—BASIC: Soft, u.t., £25 4s. 6d.; tested, 0.08 to 0.25 per cent. C (100-ton lots), £25 14s. 6d.; hard (0.42 to 0.60 per cent. C), £27 12s.; silico-manganese, £33 8s.; free-cutting, £28 8s. 6d. SIEMENS MARTIN ACID: Up to 0.25 per cent. C, £31 9s.; case-hardening, £31 17s.; silico-manganese, £34 9s. 6d.

Billets, Blooms, and Slabs for Forging and Stamping.—Basic, soft, up to 0.25 per cent. C, £29 8s.; basic, hard, over 0.41 up to 0.60 per cent. C, £30 8s.; acid, up to 0.25 per cent. C, £31 17s.

Sheet and Tinplate Bars.—£25 3s. 6d.

FINISHED STEEL

Heavy Plates and Sections.—Ship plates (N.-E. Coast), £29 14s.; boiler plates (N.-E. Coast), £31 1s. 6d.; chequer plates (N.-E. Coast), £31 3s.; heavy joists, sections, and bars (angle basis), N.-E. Coast, £27 17s.

Small Bars, Sheets, etc.—Rounds and squares, under 3 in., untested, £31 15s. 6d.; flats, 5 in. wide and under, £31 15s. 6d.; hoop and strip, £32 10s. 6d.; black sheets, 17/20 g., £40 12s. 6d.; galvanized corrugated sheets, 17/20 g., £54 4s.

Alloy Steel Bars.—1 in. dia. and up: Nickel, £50 18s. 3d.; nickel-chrome, £71 6s. 9d.; nickel-chrome-molybdenum, £78 14s.

Tinplates.—57s. 1½d. per basis box.

NON-FERROUS METALS

Copper.—Electrolytic, £287; high-grade fire-refined, £286 10s.; fire-refined of not less than 99.7 per cent., £286; ditto, 99.2 per cent., £285 10s.; black hot-rolled wire rods, £296 12s. 6d.

Tin.—Cash, £965 10s. to £966; three months, £964 10s. to £965; settlement, £966

Zinc.—G.O.B. (foreign) (duty paid), £130; ditto (domestic), £130; "Prime Western," £130; electrolytic, £134; not less than 99.99 per cent., £136.

Lead.—Good soft pig-lead (foreign) (duty paid), £131; ditto (Empire and domestic), £131; "English," £132 10s.

Zinc Sheets, etc.—Sheets, 15g. and thicker, all English destinations, £150 15s.; rolled zinc (boiler plates), all English destinations, £148 15s.; zinc oxide (Red Seal), d/d buyers' premises, £151.

Other Metals.—Aluminium, ingots, £157; magnesium, ingots, 2s. 10½d. per lb.; antimony, English, 99 per cent., £225; quicksilver, ex warehouse, £65; nickel, £454.

Brass.—Solid-drawn tubes, 27⅝d. per lb.; rods, drawn, 37⅝d.; sheets to 10 w.g., 31⅞d.; wire, 33½d.; rolled metal, 30½d.

Copper Tubes, etc.—Solid-drawn tubes, 32⅝d. per lb.; wire, 320s. per cwt. basis; 20 s.w.g., 348s. 6d. per cwt.

Gunmetal.—Ingots to BS. 1400—LG2—1 (85/5/5/5), £220 to £270; BS. 1400—LG3—1 (86/7/5/2), £245 to £280; BS. 1400—G1—1 (88/10/2), £352 to £400; Admiralty GM (88/10/2), virgin quality, £375 to £380 per ton, delivered.

Phosphor-bronze Ingots.—P.Bl, £365 to £425; L.P.Bl, £300 to £335 per ton.

Phosphor Bronze.—Strip, 44½d. per lb.; sheets to 10 w.g., 46½d.; wire, 49⅞d.; rods, 45d.; tubes, 43½d.; chill cast bars: solids 4s. 5d., cored 4s. 6d. (C. CLIFFORD & SON, LIMITED.)

Nickel Silver, etc.—Ingots for raising, 2s. 9¾d. per lb. (7%) to 3s. 10½d. (30%); rolled metal, 3 in. to 9 in. wide × .056, 3s. 3¾d. (7%) to 4s. 4½d. (30%); to 12 in. wide × .056, 3s. 4d. to 4s. 4¾d.; to 25 in. wide × .056, 3s. 6d. to 4s. 6¾d. Spoon and fork metal, unsheared, 3s. 0¾d. to 4s. 1½d. Wire, 10g., in coils, 3s. 10½d. (10%) to 4s. 10½d. (30%). Special quality turning rod, 10%, 3s. 9¾d.; 15%, 4s. 2¾d.; 18%, 4s. 6¾d. All prices are net.

Increases of Capital

The following companies are among those which have recently announced details of capital increases:—

BRITISH TIMKEN, LIMITED, Birmingham, increased by £1,100,000, in £1 ordinary shares, beyond the registered capital of £1,400,000.

ROBERT HARLOW & SON, LIMITED, brassfounders, of Stockport, increased by £6,000, in £1 shares, beyond the registered capital of £20,000.

SHELDON'S ENGINEERING WORKS, LIMITED, Wells (Somerset), increased by £24,900, in £1 ordinary shares, beyond the registered capital of £100.

TECHNALOY, LIMITED, ironfounders, etc., of Aylesbury (Bucks), increased by £4,000, in £1 ordinary shares, beyond the registered capital of £1,000.

A. FRYER & SONS, LIMITED, manufacturers of castings, of Willenhall (Staffs), increased by £17,000, in £1 ordinary shares, beyond the registered capital of £8,000.

MURAD DEVELOPMENTS, LIMITED, general engineers, etc., of Aylesbury (Bucks), increased by £9,000, in £1 ordinary shares, beyond the registered capital of £1,000.

JONES & CAMPBELL, LIMITED, range and stove manufacturers, etc., of Larbert (Stirlingshire), increased by £60,000, in £1 ordinary shares, beyond the registered capital of £60,000.

G. S. LAVENDER & COMPANY, LIMITED, iron, steel and metal merchants, of London, E.C.4, increased by £4,900, in 900 "A" and 4,000 "B" shares of £1, beyond the registered capital of £100.

COOPER BROS. (STOCKPORT), LIMITED, engineers, increased by £24,000, in 18,000 "A" ordinary shares of £1 and 18,000 "B" ordinary shares of 6s. 8d., beyond the registered capital of £1,000.

ABOUT 20 BOYS and two masters of the Borough-Beaufoy Technical School, London, were entertained on July 24 by Foundry Services Limited of Birmingham. They inspected the works and laboratory and watched a demonstration of some of the company's products in the experimental foundry. Their visit concluded with luncheon and the showing of industrial films.

Durham's Coke and Gas Expansion

Durham's £21,000,000 carbonization scheme which was recently announced should prove of great benefit to the iron and steel industry. The announcement stated that home needs of British industry, rather than export expansion, were covered by the plans, and particular attention was drawn to the iron and steel industry. It is hoped to complete the project in 1957.

A new 50-oven battery and by-product plant are being built at Fishburn and will be in production within two years, replacing the old plants at Fishburn and Thrislington. The existing coking plant at Monkton is to be extended by the construction of 33 ovens, which will double the plant's output. It is also proposed to construct a new plant alongside a new shaft at Murton Colliery and in addition there will be a new washing plant and power station. This scheme will cost £7,000,000 and is scheduled for completion in 1957. Coal in the Murton area is suitable for the making of a very high-grade furnace coke. A new washery is proposed at Derwenthaugh cokeworks, near Newcastle-upon-Tyne.

Women Engineers' Wage Claim Lodged

A claim for a £2 a week all-round wage increase for about 500,000 women employed in the engineering industries has been lodged by representatives of the Confederation of Shipbuilding and Engineering Unions. Parallel to that already made for 2,500,000 men in the industry, the claim is based on the cost of living, increased productivity, and the higher level of profits in the industry.

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LIVERPOOL, 2. 13, Rumford St., Central 1558
GLASGOW, C.2. 93, Hope Street, Central 9969

CLASSIFIED ADVERTISEMENTS

PREPAID RATES: Twenty words for 5s. (minimum charge) and 2d. per word thereafter. Box Numbers, 2s. extra (including postage of replies).

Advertisements (accompanied by a remittance) and replies to Box Numbers should be addressed to the Advertisement Manager, Foundry Trade Journal, 49, Wellington Street, London, W.C.2. If received by first post Tuesday advertisements can normally be accommodated in the following Thursday's issue.

SITUATION WANTED

FOUNDRY MANAGER (45), A.M.I.B.F. Fully and semi-mechanised plants, light engineering (5 cwt.). Cupola, sand, patternshop control. Sandslingers, grey iron and non-ferrous. Gravity die. Keen, active. Progressive outlook. Housing accommodation essential. Services available now.—Box 1921, FOUNDRY TRADE JOURNAL.

SITUATIONS VACANT

The engagement of persons answering these advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18-64 inclusive or a woman aged 18-59 inclusive unless he or she, or the employment, is excepted from the provisions of the Notification of Vacancies Order 1952

LARGE Midland Ironfoundry requires TECHNICAL SALESMAN, with practical knowledge and established engineering connections.—Box 1964, FOUNDRY TRADE JOURNAL.

YOUNG practical FOUNDRYMAN wanted by Foundry in West Bromwich, specialising in the manufacture of small high duty castings. Excellent prospects.—For particulars of experience and salary expected to Box 1965, FOUNDRY TRADE JOURNAL.

METALLURGICAL CHEMIST required for laboratory attached to founders in the London area. Applicant with experience in the analysis of light alloys, bronzes and whitemetals preferred. Salary according to qualifications and experience. —Write, giving full particulars, to Box 1936, FOUNDRY TRADE JOURNAL.

APPLICATIONS are invited by old-established firm in the light castings industry, specialising in Rainwater and Soil Goods, for the position of FOREMAN PATTERNMAKER. Good company's house available.—Applicants please give full details of past experience, present position, age, salary required, references, etc., in confidence, to SLOAN & DAVIDSON, LTD., Stanningley, Leeds.

FOUNDRY MANAGER required for large South Wales Foundry, specialising in non-ferrous metals. Applicants must have large experience in Manganese and Aluminium Bronze Castings up to 3 tons. State full particulars of experience and salary required.—Box 1958, FOUNDRY TRADE JOURNAL.

FOUNDRY ENGINEERS.—The International Mechanite Metal Co., Ltd., 66, Victoria Street, London, S.W.1. have vacancies for positions of Foundry Engineer. Principal qualifications are drawing office, design and workshop experience. Knowledge of grey iron metallurgical and foundry practice. These positions offer exceptional opportunities of advancement to enterprising and adaptable men. Wide scope of operation. Knowledge of a foreign language desirable. Willingness to travel in Europe essential. State full details of experience, technical education, age, etc.

SITUATIONS VACANT—*Contd.*

CORE SHOP CHARGEHAND required for repetition Foundry in Midlands area.—Write, stating age, full experience, and salary required, Box 1960, FOUNDRY TRADE JOURNAL.

YOUNG Man required to take charge of small Mechanised Light Castings Foundry in West Midlands. Give full details of age, experience, and salary required.—Box 1944, FOUNDRY TRADE JOURNAL.

REPRESENTATIVES required, on commission basis, by Non-ferrous Founders and Pattern Makers. Men engaged in closely-allied products not objected to.—Write Box 1891, FOUNDRY TRADE JOURNAL.

REQUIRED.—DRAUGHTSMEN, with experience of gravity diecastings.—JOHN DALE, LTD., London Colney, St. Albans, Herts. Bowmansgreen 2266.

ASSISTANT TO CHIEF METALLURGIST required by well-known Midland Malleable Ironfounders.—Apply, stating age, experience and salary required. Box 1945, FOUNDRY TRADE JOURNAL.

TECHNICIAN required for gravity casting in brass. Very good wages paid for capable man. Midlands district.—Box 1963, FOUNDRY TRADE JOURNAL.

THE CONSTRUCTIONAL ENGINEERING CO., LTD., Titan Works, Birmingham, 12, invite applications for the position of SALES MANAGER for their Foundry Plant and Equipment.—Replies, including full details of experience, age, and salary expected, should be addressed to the MANAGING DIRECTOR, marked "Personal."

METALLURGIST, with sound laboratory experience for Iron Foundry. Must have general knowledge of cupola and sand control. Salary offered will be according to experience.—Apply in first instance by letter, giving full details, to IAN ROSS (CASTINGS), LTD., 160, Bestobell Road, Trading Estate, Slough, Bucks.

SKILLED PATTERNMAKERS required for small- and medium-size pattern work. Good working conditions. Top rates paid. Canteen facilities.—SLOUGH FOUNDRIES LIMITED, Buckingham Avenue, Slough.

HAYWARD-TYLER & CO., LTD., have a vacancy in their Non-ferrous Foundry for a FOREMAN, with sound practical experience of floor, bench and machine moulding and coremaking on jobbing and batch production of simple and intricate pressure castings. The successful candidate will be expected to take charge of the day-to-day operations, including melting in oil-fired furnaces under the direction of the Foundry Manager. The salary, including bonus, will be approximately £650 p.a.—Candidates should apply in writing to THE SECRETARY, Crawley Green Road, Luton, giving details of their qualifications, age, and experience.

SITUATIONS VACANT—*Contd.*

CHARGEHAND MOULDER wanted. Fully experienced moulder, able to control labour and produce results on semi-jobbing work. Position will be a permanent one to the right man, and offers good prospects.—Box 1959, FOUNDRY TRADE JOURNAL.

CATTON & COMPANY LIMITED, Steel Founders, have a vacancy for a Metallurgical or Science Graduate. The position is one which holds considerable prospects for the type of person who is prepared to develop a career in the Steel Foundry Industry. Complete details to CATTON & COMPANY LIMITED, Steel Founders, Hunslet, Leeds 10.

METALLURGIST required for large research laboratory, Steel and Bronze Foundries. Candidates, age 25-35, must possess degree or equivalent and be prepared to take charge of Metallography Section. Salary according to qualifications and experience.—Reply, stating full details, to Box 1955, FOUNDRY TRADE JOURNAL.

SYNTHETIC RESIN ADHESIVE MANUFACTURERS require Sales Representatives for the London, Midlands and Scottish territories. Applicants must be aged 25 to 30 and of good education. Experience in the foundry trade and a knowledge of chemistry and/or engineering would be an advantage, but not essential. Prospects for selected applicants are excellent.—Write, in confidence, stating age, experience and salary required, to Box 1954, FOUNDRY TRADE JOURNAL.

TECHNICAL SALES REPRESENTATIVE required by well known Midland Iron Foundry. Applicant must possess first class foundry knowledge and have sales experience. Excellent opportunity. State qualifications, experience and salary required. Box 1953, FOUNDRY TRADE JOURNAL.

PATTERN MAKER. Vacancy for one experienced man capable of making Master Patterns and setting up intricate metal patterns. Permanent situation, advancement and experience in a modern, well equipped shop. Modern flat available for suitable applicant.—G. PERRY & SONS LIMITED, Hall Lane, Leicester.

DIE CASTING SHOP SUPERINTENDENT required. Experienced in Gravity and Pressure Die Casting, principally for Aluminium Alloys, also a knowledge of Die design is desirable. Good working conditions. Prospects for the right man.—Apply to the Personnel Manager, KENT ALLOYS LIMITED, Rochester, Kent.

FIRST-CLASS IRON FOUNDRY FOREMAN required for a progressive Engineering concern in the North Staffs area. Successful applicant would be responsible from stock yard to finished casting, in a jobbing foundry, employing 40 personnel, manufacturing all types of green and dry sand castings up to 6 tons. Must be a keen disciplinarian and capable of setting piecework prices. Excellent conditions and salary to the right man.—Write, with fullest details, to Box 1962, FOUNDRY TRADE JOURNAL.